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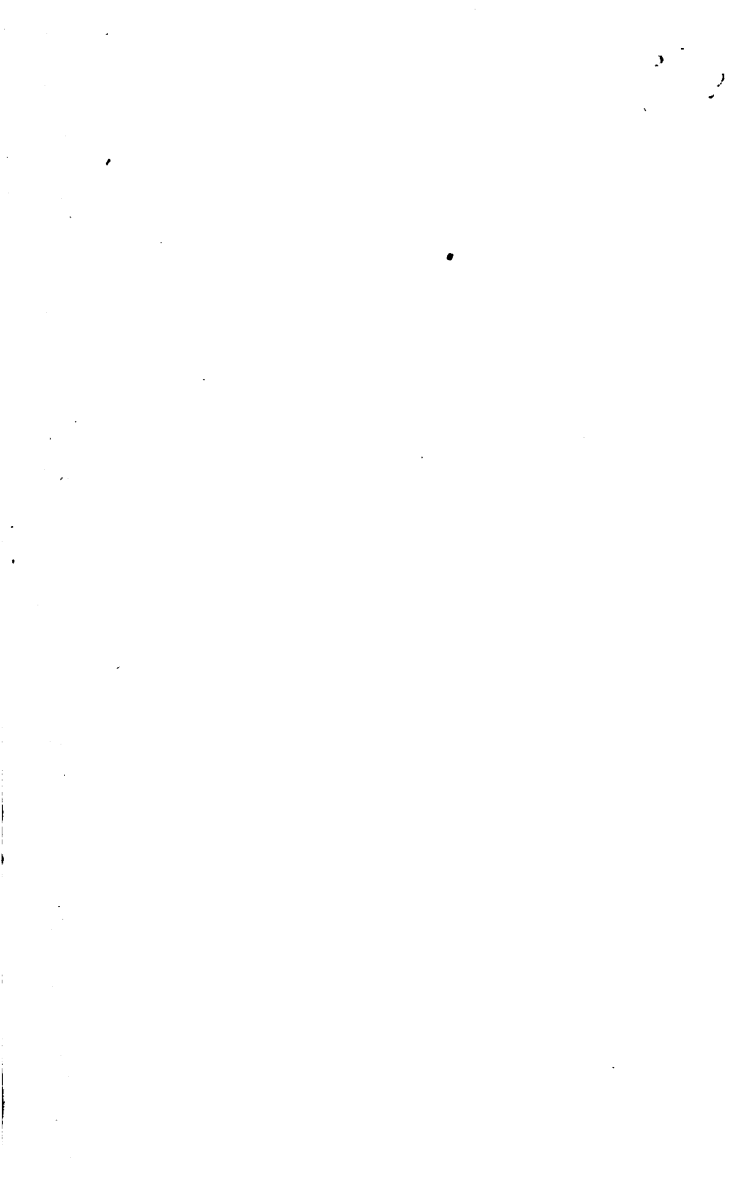
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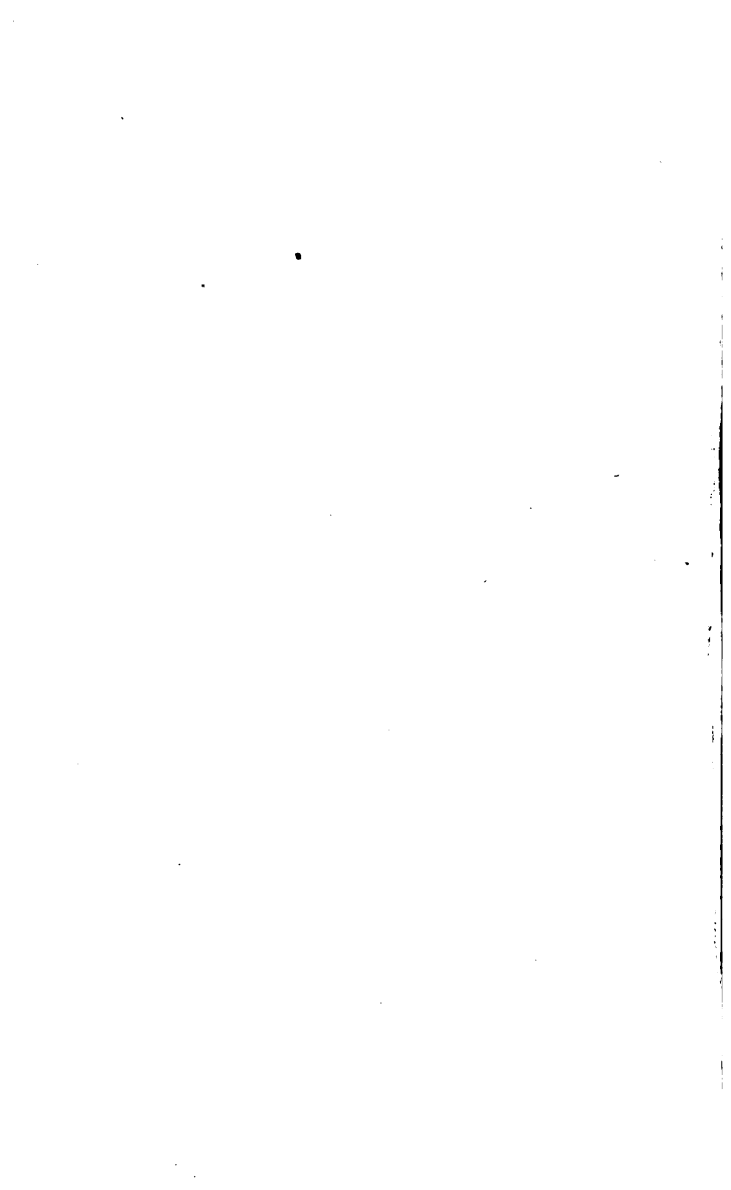
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The New Educator's Library presents in a convenient form that is likely to appeal to many specialist teachers and others whose interest lies in a select few of the aspects of Education much of the subject matter of *The Encyclopaedia and Dictionary of Education* recently issued by the Publishers; in fact, the scheme is due in great measure to the suggestions of many readers of the latter work, pointing out the desirability of issuing in sectional form the authoritative contributions on the various subjects.

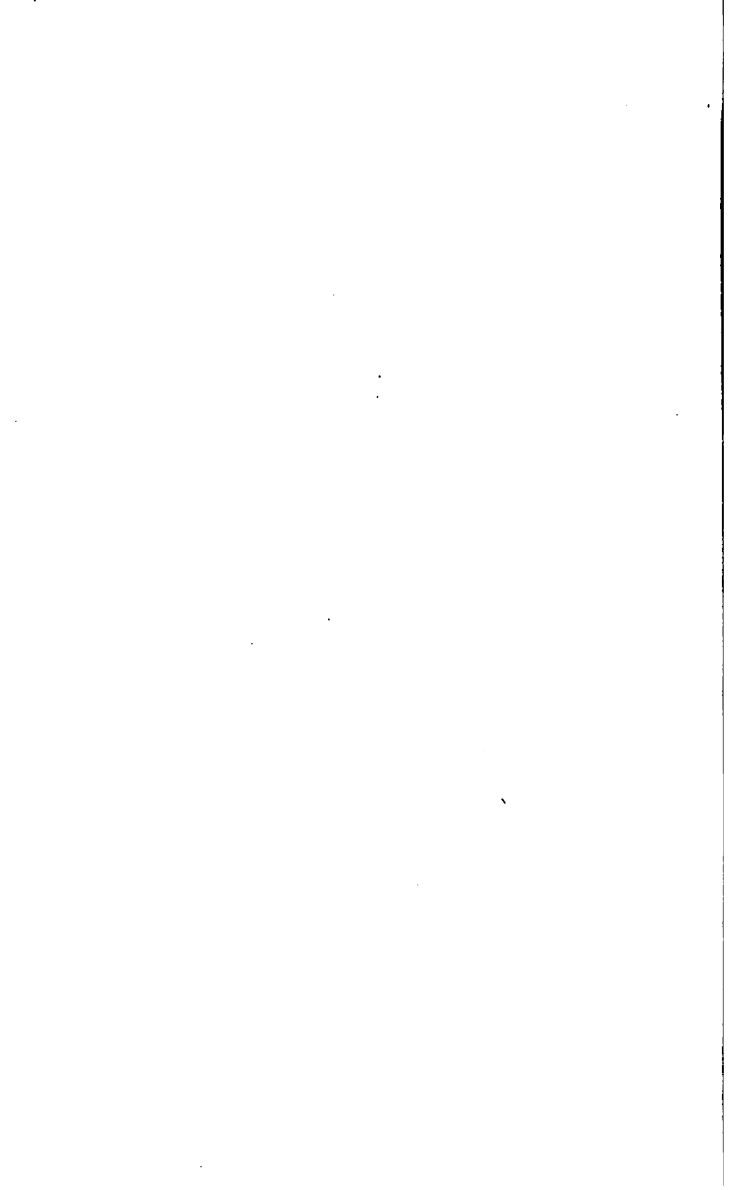
It is hoped that these little books embodying, as they do, the results of research and experience of educationists and others of high distinction in their subjects, will serve a really useful purpose to teachers, to students, and to many others connected with or interested in educational matters.

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To Mr. J. M. L.
Albuquerque, N.M.

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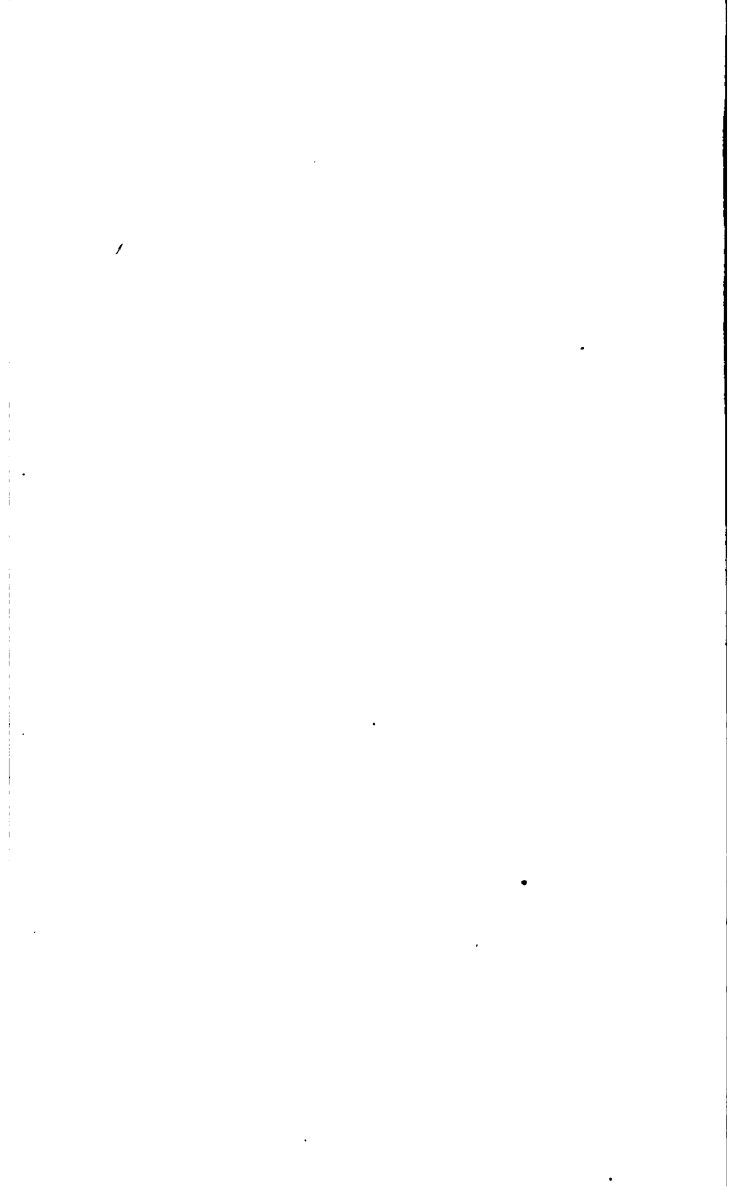
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IDEALS, AIMS AND METHODS IN EDUCATION

SECTION I

AIMS AND IDEALS OF EDUCATION

THREE problems are involved in a discussion of the aims and ideals of education.

I. The first concerns the nature of aims and ideals generally speaking. What is their nature in relation to actual conditions, to positive fact, to customary experience? It is quite clear that an aim, and still more, an ideal, involves dissatisfaction with existing conditions, and an effort to depart from them. But out of what material shall the aim and ideal be then constituted? Whence shall it be derived? What shall guarantee ideals against being mere products of fancy? An aim, in short, while it contrasts with the existing state of affairs must have sufficient contact with it to be practicable, to be capable of application to re-direction of existing conditions. An ideal, unless its value is to be purely emotional and inspirational, can differ from an aim only in possessing greater generality, greater scope and depth.

The problem has a definite bearing upon the discussion of educational aims. In general, they are divided into two classes: Those which find the ground of dissatisfaction simply in the ignorance, immaturity, lack of skill, and control of the young; and those which draw the material of their ideals from dissatisfaction with existing social conditions.

IDEALS, AIMS AND

The first has the easier task. It derives its aims from the best achievements of existing adult life. Its essential aims are to reproduce these standards in the young; to bring the latter up to the level of what is best in the traditions and customs of the people to which those undergoing education belong. Education is conceived of as essentially a process of transmission and indoctrination.

The other school derives its aims and ideals from a consideration of the defects of existing society. Its dominating ideal is social reform, re-organization even on a large scale. It regards the period of immaturity not as something to be passed through on the way to reaching the adult level, but as an opportunity of progress to be taken advantage of in the process of creating a new and better society. Plato's educational scheme is a typical instance of this educational philosophy. The special aims of education are connected with an ideal of social reconstitution. Apart from his larger plan of social modification, they have no meaning or validity. The educational writings of Aristotle, on the other hand, assume as the aim of education the general maintenance of some existing polity, or, in particular, the production of a character embodying the best traits of the cultivated Athenian citizen. In modern times, the radical social thinkers, like Godwin in England and Helvetius in France, conceived education as the potential means of establishing a new social order. The latter, in particular, exaggerated Locke's idea of the mind as originally blank, and regarded the differences among men as the product of practice and of the influence of the environment, and so asserted the omnipotence of education. It can create, if properly directed, a new type of character which will manifest itself in a new social and moral régime. Curiously enough, Rousseau, who started from the opposite premise of innate qualities and a natural inner development which education must respect, comes to the same practical conclusion. Existing society, with all its evils and oppressions, is the result of thwarting natural powers and distorting the intrinsic

course of development. An education in accord with Nature will, therefore, be the surest way of avoiding the corruptions and enslavements of existing civilization and of creating a new and purer social type.

This brings to light another distinction between the ideal of transmission and reproduction and the ideal of a reconstituted society. The former relies logically upon the use of organized subject-matter, representing, as in Matthew Arnold's definition of culture, the "best of what has been thought and said." It regards education as essentially a process of *instruction* by which the mind is moulded into conformity with the models presented in the subjects studied. Plato, on the other hand, insisted upon the need of creation of *new* studies, such as mathematics and dialectics, insisting also upon the need of careful purging and rigid censorship of existing materials. Rousseau and his modern followers subordinate inculcation of any and all subject-matter to the natural unfolding of native powers. The ideal of education is not a shaping or forming from without, but a developing from within.

Another sharp clash in educational ideals is properly connected with the distinction under discussion. Some theories have emphasized the social aim of education, others the individualities. This opposition is not, however, ultimate in character. Upon examination, it will be found that the ideal of "a complete and harmonious development of all the powers—spiritual, mental, and physical—of the individual" (the favourite formula for the individualistic aim) implied, as its counterpart, a new and better society. A direct social aim was not contemplated because the educationists of this school—such as Pestalozzi and Froebel—were acutely conscious of the evils of existing society. To have trained for membership in such societies would, in their minds, involve distortion and corruption of individuals, and a perpetuation of existing defects and wrongs. This motive appears vividly in the educational writings of Kant, who

sets up a remote social ideal, the evolution of an ideal humanity, but who is opposed to public education—education for citizenship, because that signifies that education will be conducted by the ruling class not so as to develop humanity, but so as to produce warped personalities as tools for the execution of the rulers' purposes. The same ideal was clearly expressed also in the closing years of the eighteenth century by Humboldt in his essay on the *Limits of State Action*, which exercised such an influence upon Stuart Mill: "An unhampered development of all the powers of the individual is the surest road to a redeemed social order."

If educationists are confined to a bare choice between the ideal of social transmission on one hand, and complete social transformation on the other, they are in a sad plight, and their choice will have to be made arbitrarily—not on educational grounds, but on grounds of general social and political preference. But the value of the opposition as it is presented by extreme thinkers is that it puts before us *factors* that must be reckoned with in forming all educational aims and ideals. The forces making in practice for the more conventional and conservative ideal are strong. They almost enforce themselves without any assistance from the side of philosophic principles. The most vehement educational reformer, if he attempts the definite work of concrete instruction and discipline, finds himself thrown back upon existing materials and habits. It is not possible to escape from them. He must employ transmitted material as the *means* of education. But that does not signify that the *ideal* shall be found in the means.

The problem is to use existing knowledge, habits, institutions, as means of producing characters that, in being sensitive to what is best in existing civilization, shall also be critical of its defects, and equipped for its improvement. The radical or revolutionary school that has found its ideal in contrast with existing conditions has made a valuable contribution which must be included in every sound philosophy of education. Childhood and youth are not

merely periods of immaturity. They are not chiefly negative. The period of special need of education is not one of defect or gap, of absence of adult achievements and standards. Plasticity does not signify a mere passivity to be shaped from without. Childhood and youth present something positive and active, the power of *growth*. They present, therefore, the maximum *possibilities* of social improvement and rectification with the minimum waste and friction. Social reform that deals with adults whose habits of thought and feeling are more or less definitely set, and whose environment is more or less rigid, is working at a disadvantage.

II. The Relation of Aims and Ideals to Existent Facts. We find here the solution of the problem of the relation of aims and ideals to existent facts. Growth is itself the primary fact with which education deals. To protect, sustain, and direct growth is the chief *ideal* of education. It remains to make this general statement more definite by applying it to consideration of some of the chief aims about which educational discussion turns. The purpose will be to show that growth as an aim includes what is valuable in all of them. Our second chief problem concerns, then, aims and ideals which have obtained a certain vogue, such as preparation for life, discipline, natural development, culture, social efficiency, etc. How are they related to promotion of growth as an aim?

The ideal of preparation becomes self-contradictory when it is not secondary to the maintenance of the process of development. This is true, whether we take the half-formulated aims of preparation for promotion, for passing examinations, for entrance into some higher school, or the generalized conception of Spencer that education is adequate preparation for life. The end, if conceived merely as something delayed and postponed, something affecting exclusively a future time, has no intrinsic connection with the student's present activity. It fails to supply adequate motive power. A vaguely-discerned future disconnected from the

present has little impelling power. It is so adventitious, that external stimuli have to be resorted to, such as threats of immediate penalties, promises of immediate rewards. A merely remote end also encourages procrastination. The present offers many attractions. These tend to crowd out an aim which can be realized only in some indefinite future. Making preparation the chief end fails, in other words, to secure good preparation. Continuous growth, on the other hand, effects a continuous re-organization of powers. Although it has an application in the present (since the pupil is to be growing here and now), it also leads continuously into new fields. The process of realizing present possibilities means a constant advance. It results in preparation, although preparation is not made the mainspring of effort.

The so-called individualistic aim, self-realization, or the full development of all powers, can be made definite and effective only when translated into terms of growth. As has often been stated, the ideal of complete development is only a species of the preparation ideal. Development is conceived as a product—not as a process. It is thought of emotionally rather than intelligently. It stands for something noble and sublime, but something projected into the mists of the unknown. Development, on the other hand, as an active process means *developing*—something taking place, if it takes place at all, in the present. Hence it is capable of observation and record; it can be made definite. Whether a pupil is now growing and in what direction, are matters of fact and not of blind aspiration for something far-away. Moreover, a purely future and remote development of all powers fails at the precise point where it makes its chief claim. It is not truly individual, but is a general formula whose exact application to individual pupils remains uncertain. Since no two pupils are duplicates of one another, complete development cannot signify for one person what it means for another. The quality of growing, on the other hand, is an individualized affair. The question is whether the

particular person is living up to his own possibilities. He is judged on the basis of his own powers and his own environment. The test is whether he is taking full advantage of them. Complete development does not mean something abstract and absolute, but something relative to individual capacities and opportunities.

If the principle is clear, it is not necessary to apply it in detail to conceptions of culture, training or discipline of faculties, etc. / Culture must mean a present refining, broadening, and fostering of processes of growing, if it is to be an aim available for guidance, and not a vague aspiration which can be rendered definite only by arbitrary translation into personal taste and preference. The idea of discipline through repeated exercise of faculties upon definite tasks has been founded upon a conception of faculties which present psychology holds to be mythological. It has also been used as a defence for all measures which make learning so difficult as to be obnoxious, while all outworn traditionary topics have protected themselves from examination by a claim to be disciplinary. Discipline can be substantiated as an aim only in so far as we fix our attention not upon vague so-called faculties, but upon actual instincts, impulses, habits, desires, and ask how these are to be so employed as to lead to increase of present *power*—of power to do, to accomplish. Only the incorporation of the idea of growth will render the idea of discipline positive and rational.

III. Growth as an Aim and Ideal. Does not, however, the conception of growth imply something final and remote toward which growth is directed? Must we not conceive of growth as approximation to a far-away goal? If so, growth cannot be an aim and ideal except in a secondary sense. This question raises some of the deepest issues of philosophy. Is the universe static or dynamic? Is rest superior to movement as a sign of true reality? Is change merely a falling away from or an approach to something fixed, changeless? Is evolution a positive thing, a reflex of

power; or is it negative, due to defect and the effort to pass beyond it? An adequate discussion of such questions would take us far beyond the limits of this article. In addition to noting that the philosophy of education—here as elsewhere—finally leads into general philosophy, we must content ourselves with two remarks.

In the first place, the conception of growth as merely a means of reaching something which is superior to growth and beyond it, is a survival of theories of the universe as being essentially static. These theories have been expelled by the progress of science from our notions of Nature. Motion, change, process, are fundamental. In the last half century these same ideas have been successfully applied to the life and structure of living things, plants and animals. The moral sciences, to which education belongs, have become the last refuge of ideas which have lost their intellectual repute elsewhere. The scientific presumption is working against them everywhere.

In the second place, even if our ultimate philosophy accepts a static conception of reality to which growth is relative, yet the educator, if his aims are to be at once definite and capable of support upon the basis of ascertained fact, must start from the process of growth. He must obtain from it clues and hints as to the nature of the final end, instead of trying to decide what is and what is not growth on the basis of a conception of an ultimate end. Opinions as to the latter differ widely. To start from that end is to involve education in disputes that cannot be decided except by personal taste or the acceptance of external authority. The physical growth of a child can, however, be decided by tests applied to present conditions—observable and recorded changes in height, weight, and other phenomena. These things, and not an ideal of an ultimate physical perfection, guide the wise physician and parent in estimating whether a child is growing, standing still, or retrograding. The problem of the educator is, likewise, to devise means of studying and discovering changes actually

going on in the mental and moral disposition of pupils, and to construct criteria for determining what these changes signify with respect to growth. Only as the philosophy of education recognizes that for *its* purposes, at all events, growth is the chief aim and ideal, can philosophy be applied intelligently to the specific facts of education, instead of remaining a body of remote and inapplicable—even though lofty—conceptions.

SECTION II

VALUES IN EDUCATION

THE value of a thing depends upon its suitability for the purpose or aim that is proposed for it. Educational values are dependent upon the educational aim, and this in turn rests upon a conception or philosophy of life. Philosophies of the hedonistic or utilitarian or perfectionist type will involve corresponding notions as to the purpose of education, and will hence place corresponding emphasis upon particular instruments of education. To few, however, is it given to frame consciously a systematic conception of life; a great part of the community has formed its views, partly as the result of an inherited tendency or disposition, partly as the sub-conscious result of the play of environment, without any intentional or purposeful reasoning process. A still greater part of the community has no notion of life's purposes, and therefore cannot be said to have true educational aims. Nevertheless, it is approximately, and in a truly democratic country absolutely, correct to say that the educational aim of the State depends upon the social, political, and moral views of the whole community—upon what the community as a whole feels to be its highest good. At the same time, the purposes of State administrators may be so carefully hidden from the majority of the citizens, or so coloured, as finally to induce the citizens to give their assent to aims quite opposed to their natural ways of thinking and feeling.

The thinking part of the community possesses certain notions as to the aims which education must seek to achieve, has certain ideals which it regards as all-important, and insists that the educational system shall be such as will give a proper place to those ideals. Influence is brought to bear upon statesmen, legislators, and educational bodies in order that these views may be realized,

The State, however, is not always greatly influenced by these persons in its administration of education.

A great diversity of views exists with regard to these aims. (Some place stress upon the training of character, others upon culture; some select personal or social morality, others adherence to a particular religious creed.) (Of those who possess a closer acquaintance with the educational machine, some aim at what is called "discipline," others at providing the children with some general power to do things, at forming the many-sided, practical citizen; some, again, insist that education shall fit the man to do some one particular thing well. There are some who regard the possession of knowledge as the vital purpose of education; and others, again, who demand that the school shall train the pupil's power to think, either in special or general directions.) Character, culture, morality, and religion are commonly regarded by those who wish to see education occupy itself with such objectives, as ultimate ends; discipline, knowledge, and thinking power would be acknowledged by their votaries as secondary aims subservient to higher ends. In confused thinking, however, the latter are often placed on the same level as the former; whereas, strictly speaking, they are educational values which are means to more remote aims.

The Danger of Using Ambiguous Terms. Such terms as "character," "discipline," and "knowledge," suffer the usual fate, and mean different things to different minds. The connotation of any one of them may, or may not, contain the connotation of one or more of the others. To many, for example, character or culture are inconceivable without a religious basis. For some, the State religion forms an essential part of culture, and even of character. Discipline, again, is by some conceived as self-control with regard to definite specific sides of life; by others, with regard to *all* conduct. To some it expresses the idea of prohibition with regard to different kinds of pleasure, to others the idea of positive guidance of conduct, strength of

will positively expressed. It is even the belief of some that "discipline" involves the possession of a particular kind of knowledge or ability. In all cases, it would probably be admitted that discipline is only the process, and that the disciplined individual is the end in view. The term "knowledge," too, suffers from ambiguity. It may mean mere information, scrappy or systematic, or it may mean the power to employ the knowledge in useful directions, either to some specific and limited department of life or to wide and general purposes. The word may, to some, connote also the power to judge and reason in special or in general directions.


It is necessary to recognize this diversity of significance in the above terms, for the varied meanings are responsible for a great part of the confusion of thought with regard to educational values. It is probable that a remarkable amount of real agreement among educationists would be discovered if the terms were more clearly defined.

Curriculum. ~~Subsidiary to these aims, and logically dependent upon them, is the subject-matter of instruction.~~ According to our different ~~views of the purpose~~ of education, we shall desire to provide particular kinds of subject-matter and particular types of bodily and mental exercise. The instruments of education we shall desire to see suited to the aim. Hence, ultimately, the term "educational values" will be made to refer to the relative worth of the various parts of human knowledge and activities. And the question becomes: "What shall we teach the children of the nation?" or: "What is most worth teaching them?" In other words, we have to decide what the curriculum shall be; what subjects and what facts within those subjects are most worth learning; what activities of our highly civilized community are most worth mastering; what knowledge and what powers are of highest educational value to children with reference to the aims we have in view.

Divergencies of aim will naturally produce differences in the curricula of schools, even of those

of the same type. And yet, since the practice of mankind is often superior to its theories, these differences are not so great as might be supposed. This is partly due to the reason previously stated, that the connotations of the terms expressing educational aims cover one another to a considerable extent. Where narrow views of culture and of character prevail, contradictions in estimating values are sure to arise. For example, independence of character or originality might be partially sacrificed to the desire to hand on to our pupils the traditional learning and culture of the past. When it is clearly realized that our educational aim must include *all* the highest ideals of mankind, and when the nature of these ideals is more exactly understood, only then will it be possible to place reliable values upon the elements of knowledge and ability. One thing is certain; these ideals cannot be attained by means of a narrow curriculum. The school will have to represent the real world in all its typical aspects—man and Nature, thought and action. The good, and even the evil sides of life must be presented, the latter naturally only to such an extent as the pupil's stage of development makes expedient.

Disciplinary Value and Formal Training. The notion of the "disciplined" mind, when it becomes the educational aim, has a considerable influence upon the values assigned to the various departments of knowledge. It is thought by some that certain studies are essential, and of supreme value, because of the training or mental discipline they are supposed to afford. Nature study, for example, is regarded as indispensable because it is said to develop the powers of observation and memory; grammar because it is "the logic of the elementary school," or, in more usual language, because it trains the power to reason. In higher education, the study of the classics is still urged for the alleged reason that it results in producing the best type of mind—sharpened in its entire range, in memory, observation, attention, imagination and judgment. It is also said to produce accuracy, and other



qualities which may be regarded almost as virtues; and to give rise to ideals which influence all departments of the individual's life. Arguments of this kind are to be heard wherever a new "subject" is suggested for the school, or whenever the position of a "subject" under suspicion is attacked.

The question of "discipline" involves the further question of formal training. Arguments of the kind just indicated must be met by asking for rigid proof of the facts asserted. General impressions even of sincere and successful teachers are quite insufficient. The onus lies upon those who make the assertions to prove them; to show, for example, that the general memory is strengthened by practice in learning poetry by heart; that a course of botanical study produces more acute observation in other and quite different fields of study; that a course of training in formal logic produces ability to reason equally well in a game of chess, a financial, or political, or domestic problem.

During the last ten or fifteen years considerable attention has been given to this question. Experimental work has been carried out, chiefly in Germany America and England, to ascertain whether, and to what extent, this transfer of power takes place. On the more purely pedagogic side, Meumann in Germany, Thorndike and many others in America, Winch and Sleight in England, have published results which are in some degree contradictory; although the view that transference is, as a rule, remarkably small seems now to have found general acceptance. In any case, enough investigation has now been carried on to provide proof that memory, attention, imagination, judgment, and other powers of the mind, are not "faculties" which can be sharpened or developed *generally* on some specific material, but that each is a large hierarchy of powers, one member of which *may* undergo development not only independent of, but sometimes to the detriment of other members. Thus the power of judgment with regard to probable weather *may* be strengthened altogether independently of the power of judgment with regard to the

outcome of a war. And so with memory and other "faculties." Some writers continue to discuss this matter without paying sufficient attention to the meaning of the word *may*. It is not asserted that training in a specific direction does not "spread" and spread widely; experiment proves that it may, and also proves that it may not. The youthful, or immature, unthinking mind will have little chance of reaping the *general* effects of *specific* training; the person who has sufficient industry or power of thought to note carefully how his specific training can be turned to account in other directions, how methods used in acquiring one set of facts may be applied in acquiring others, will have in his hands the key which will open many doors of knowledge—otherwise each as difficult to open as before training. Concepts of his method will enable him to attack new work in an intelligent manner, but will not enable him to dispense with the "practice" which the conquest of each new domain of ability demands.

Since the mind, especially the immature mind, appears to work in this "compartmental" manner, it seems correct to infer that our educational salvation lies, not in giving a fictitious value to what are sometimes called "disciplinary subjects," but in making certain that our pupils come into direct touch, as far as possible, with *all* the typical sides of life. At the same time, the disciplinary side must not be neglected; the connection between the domains of knowledge and ability must be gradually brought home, and help given in forming concepts of method which will bestow the power of tackling new work.

Intrinsic and Relative Values. Whichever way the problem of values is attacked, the same conclusion is reached, viz., that that knowledge and capacity is of highest value to the pupil which is representative of the world about him. One important result of such a conclusion will be to avoid the common and specious error of endeavouring to evaluate material suggested for the curriculum by considering what disciplinary influence it

possesses, whether of the intellectual or emotional kind. In evaluating material, all we need to consider is its *intrinsic value*. Using such a standard, it seems possible to arrive at the relative values of the parts of human knowledge and skill; values which it is almost needless to say will fluctuate with social, economic, and other conditions.

Many attempts have been made to fix the relative values of subjects, and subject-matter; nearly always, however, with the intention of satisfying two standards: the standard of intrinsic values, and that of discipline. So great confusion has resulted that many educationists have come to the conclusion that it is, even for the primary school curriculum, an impossible task. Professor Dewey and Mr. Raymont seem to be of this opinion. Professor Bagley, on the other hand, notwithstanding his views upon discipline, appears to evaluate the elements of instruction at any rate partially on the lines already criticized. Professor Findlay attempts to estimate values by a consideration of traditional values, on the assumption that permanent past values have proved their worth. The ignorance of masses of the population has resulted in the formation of another standard of values known as "utilitarian," which in its best form is expressed in the demand for a thoroughly practical education.

The formula of intrinsic values will cover all cases; but there is no doubt that in its applications to education in general, it will undergo modifications. The values of the different branches of instruction will vary according to the individual, the sex, the geographical and social position, and the age of the pupils. It is none the less reasonable to believe that for the masses of primary, and possibly secondary, school children up to the age of 12, curricula built up on the principle of "intrinsic" values should exhibit only unimportant differences. The need for specialization after that age will bring about more important changes, although the need for a liberal, wide education is permanent, and should not be

neglected to satisfy the eager demand for special knowledge.

The question as to how far the State should make its voice heard in the evaluation of the material of instruction is becoming at the present moment increasingly important. If the State administration is the organ of a democratic society, then it may be said that society acquiesces in the State's estimate of values. Moreover, there is little doubt that during years of national crisis the State may modify curricula without the consent of the nation. Whether this should be allowed in normal times, and to what extent it should be permitted, is a question so far unanswered. Attempts, open or hidden, have been made by various States to militarize the peoples by means of school training. Systematic attempts have also been made, by means of emphasizing or enlarging certain parts of school curricula, to divert pupils from afterwards pursuing certain callings. An emphasis, for example, upon practical science has had the effect of increasing the numbers of those entering technical workshops; upon language studies, of increasing the numbers in clerical occupations. In examining the right of the State to do this, two points should be remembered. First, that every function of the State should be exercised for the good of the individual members; the ultimate aim of national life is to make it possible for each individual to realize his highest possibilities. Second, that the power of the State to do this depends largely upon a systematic procedure, which necessarily often cuts across an individual's capacities and possibilities of self-realization. So long as the State is self-governed, this danger cannot be great; but a despotism may be able, by means of the education it imposes, to make willing slaves of the people.

SECTION III

RATIONAL EDUCATION.

EDUCATION is training for life; no narrower definition will convey its full scope. It covers the greater part of life, and includes the influences of nursery and home, of companions and surroundings, of business and marriage, just as much as those of school and college. It is these last, however, as being those we can directly control, that we have specially in mind when we speak of education, though we should always be conscious of the large background of other educational influences which surround and complete them.

Education is training for life, and therefore has a twofold purpose: to give a general training for the normal life of a citizen of a civilized country, as well as a special training for the particular career that he or she will follow. While the first is the main purpose of the school, it is a mistake not to keep the other in view as well, at any rate in the later years; and both alike rest on the same foundation of powers and habits. There should, therefore, on the intellectual side, be three clearly marked stages in a rational system of school training. First, the preparatory stage (in general, from 7 or 8 to 12 or 13) of learning to use the tools, physical and mental, with which the child must work. Then, for the next four years, a wide course of general training—wide, because there are so many powers and interests and kinds of knowledge required for any kind of reasonable life, and also in order to give the opportunity of discovering the aptitudes that should be specially developed in the next stage. This comes after, when some specialization ought to begin in accordance with the native "bent" and the definite requirements of a future career.

Intellectual Training. The preparatory stage is essentially the time of learning by doing. There is little need now, especially since Dr. Montessori has given a new application to the principles of Froebel,

to insist on the importance in these earlier years of getting at ideas through actual familiar things, and training the brain through the senses, and especially through the hand. Drawing, modelling, and constructive work of all kinds are of as much importance at this stage as reading and writing. Song, dramatic action, practical work in house and garden, ought to have a large place in the classroom and on the time-table; and the command of the necessary educational tools will come the more readily, and with the more certainty, for coming often in the guise of real work or of play rather than of the classroom "lessons," which seem to the child to have so little relation to either. In this way should be acquired the familiar use of one's own and another language as a means of expression, a practical knowledge of arithmetic and geometry, the habit of investigation by observation and experiment, a love of song and story, and some practice of arts and crafts. Then comes the second stage, in which these things are carried further and studied more formally. This is the time for grammar, algebra, a "dead" language, separate branches of science, and a more formal study of history and the arts; ideas and their relations being now the main things to keep in view, to be reached from many different sides. This general course must be wide and varied, if only to give every child a chance of "finding himself," and so to reveal in what direction his powers mainly lie, and what therefore should be his later more specialized line of work. When these have been discovered, the final stage is reached, and the work must be narrowed and intensified. Whatever line is chosen, it must not be too narrow; the humanities must have a place as well as the utilities. Just what can be done is largely decided by the requirements of the professions and of the examinations that give access to them or to the universities. A really rational system of education demands a more rational examination of system.

Physical Training. Only one side, that of intellectual training, has yet been touched on; and, if

we keep the whole of life in view, the others are of no less importance. Physical training is usually thought of as a matter of games and gymnastics. These are, no doubt, its first requirements: games first and foremost, as giving the motive and enjoyment that make exercise most healthful; but needing to be supplemented by a complete system of movements, such as the Swedish, to give more conscious control of the whole body. It is a great mistake to let a boy grow up with the idea that games are the only form of healthy exercise, when so many forms of useful work can give the same benefit, and an enjoyment that will increase instead of diminishing with later years. This is another reason for including in the school course much manual work of varied kinds—in garden, orchard, and farm; in the care of playing-fields; in the workshop and the house. We must ensure other conditions of health as well, and give healthy habits and some consciousness of the laws of health. Food, clothing, fresh air, hours of sleep, all must be taken into account as conducing to this end; and most essential of all, though most frequently left to chance, we must see that children grow up understanding their bodily needs and powers, and aware of their use and misuse, with reason and feeling alike enlisted on the side of self-control.

Character Training. This brings us to the third side of education, that of the training of character. The most important thing about school is its discipline, but this does not mean that where discipline is sternest there is the best character-training. It is not dependence on another's will that must be our aim, but the development of self-control; and this can be developed only where there is real freedom of choice and a considerable amount of self-government. We do not want to produce minds that can only take things on authority, at second-hand, but that will demand that reason shall be satisfied and will investigate for themselves. Not that as much freedom can be allowed in the earlier stages as in the later. We shall, at each stage, give as much freedom as we wisely can, and, wherever

possible, in making and enforcing rules, appeal to the good sense and good feeling of those who must obey as well as of those who must maintain them, and so establish government by consent. That a large part of the school government should be in the hands of prefects is now an established custom in English schools; and this may in various ways be still further extended by a wide range of school duties. And if questions of rules and the school customs that form no small part of its discipline are from time to time discussed by a "School Parliament," containing representatives of every part of the school, this will go a long way to make self-government a reality. The main function of school as a training ground for character is to give greater scope than the sheltered home life, with a wider range of duties and opportunities, bringing in the needs and problems of life in a larger community. That education will be most complete which includes most sides of the child's life and gives the widest training. This is the great advantage that the boarding school has over the day school: that it more fully controls so many kinds of training, of body and character as well as of mind.

This, too, is why a truly rational system of education will be co-educational. To confine school life and training to each sex is to deprive it of a large part of its value, both at the time and, still more, for its influence in mutual knowledge and respect, in habits of comradeship, and in a much wider and healthier outlook on the whole of life after school age. Whatever the kind of school, its whole life should be planned *not* to turn out the boy or girl, with the least expenditure of trouble, to a stereotyped pattern, but to allow of freedom of growth, to develop individuality, to train self-control. We are too apt to think of our work as "moulding" the child's character, "implanting" faculties, and so on; metaphors which imply that we shape passive material. On the contrary, our main work is to give him the opportunity and the desire to educate himself, with no more interference from us than is necessary to check undesirable

end { tendencies and interference with others. School is, above all, a place of opportunities, a place in which to awaken motives and establish habits that shall be carried on from these preparatory years into the wider education of life; and that education is most rational which provides the environment most helpful to this purpose.

SECTION IV

A LIBERAL EDUCATION

"EDUCATION" means the drawing out of the good powers of a pupil, chiefly of the mind, and particularly his powers of reaching truth and admiring beauty. Those who educate do so, after a certain amount of grounding, by bringing to a pupil's mind, with comments, the thoughts of illustrious men, and the facts of nature and history. The word "liberal" has its origin in such Latin phrases as "*Liberalia studia*," "*Liberalis doctrina*," and these are themselves translations of Greek phrases referring to education, which contain the word *ἐλευθέριος*. The idea they all contain is that of an education suitable for a man who was *ἐλεύθερος* (*liber*, "free"), as opposed to one who was a slave. Slaves were supposed to need only such knowledge as would make them useful to their masters; that which a freeman needed was settled by various States according to their several ideals. In Sparta, a military State, training was chiefly of the body, and education as modern nations understand the word was little known. In Athens, education was of two parts: *γυμναστική* and *μουσική* (education of the body and of the soul). The former dealt with bodily exercise, and rhythmical and graceful movements; the latter with the reading or hearing of good literature of all kinds—historical, lyrical, dramatic, and oratorical—together with music and the science of number, and, further, with the speculations, generally oral, of philosophers on physical and metaphysical subjects. This education was called *μουσική*, because of its connection with the Muses. It had to do not with the earning of a living, or the increase of bodily comfort, but with making men capable of serving the State. Much of the literature read and heard was concerned with the

gods, their behaviour, and the duties of men to them; and this part of education was viewed, at least from about 460 B.C., with considerable misgiving by thoughtful men. *Μουσική* implied, as a grounding, a knowledge of *γράμματα*, which amounted to not much more than the power to read.

The early Romans were somewhat like the Spartans; but, as their empire grew, education, as the Athenians understood the word, was gradually introduced. In the later days of the Republic, Romans, liberally educated, knew Greek and Greek literature, but their bent was always towards that which was material and practical. Chemistry and physics, and even mathematics, had in those days but little bearing on actual life; and the Romans comparatively disregarded them, thinking most of education in oratory, both forensic and political, and of literature which had a visible outcome—namely, the drama, chiefly comedy: though even this struggled without much success against spectacles which consisted of fights between wild beasts, and between wild beasts and men, and between men.

Modern Views. In modern times, in many ways, ideas about liberal education remain as they were in Greece. Education is still considered in relation to character; schools as providing social qualities; and advanced education is still, in the main, the prize of the few. And there is the same hesitation on the part of educational authorities to identify their objects with those of religious teachers.

But, since classical times, many centuries have passed, in which always some men have been working in the ways of peace. The Christian religion, which, in theory, favours these, has long been dominant in Europe. The printing-press has greatly extended man's knowledge, and made it more accurate and permanent. The power of locomotion has greatly increased and quickened man's intelligence. All this has tended to change men's ideas about "liberal education." First, since in theory there are no slaves in Europe, the beginnings of it are given to every one, and "liberal education "

itself may be had by any one, male or female, who can pay for it; secondly, there is so much wealth in the world, and life has become so settled, that the time of study for pupils is somewhat prolonged; thirdly, on almost all branches of learning so much subject-matter has been accumulated, that they have grown in dignity, and seem fitter than once they seemed to be included in the education of a liberally-educated man. Commerce is no longer blind and for individuals, but it is a bond of nations, and proceeds on principles on which depends the welfare of mankind. Chemistry and physics are great sciences, resting on an immense number of facts; and they have brought so many inventions into the world—many of them beneficial and all of them striking—that they have become popular and even seem to some to provide an explanation of the universe; and have, in fact, so much arrested popular attention, that they often appropriate to themselves the title of science, and by the expression “men of science” people often mean simply chemists and physicists.

Thus, constantly, the old hierarchy of the sciences, described above as the main subjects of liberal education in Greece, has admitted, and is still admitting, other sciences into its company; and not only mathematics, chemistry, and physics—which have always been there, though somewhat insecurely—but also botany, political economy, geography, and mechanics are there also, and at least in the newer English universities are held in equal honour with the more ancient philosophies. Each nation in Europe has changed its educational ideals in the ways indicated above; but each assigns to the various sciences their value according to the bearing which they have on the nation's characteristics. For instance, Frenchmen probably think more than others about the graces of behaviour, Englishmen about facts and commerce, Germans about discipline and research; and these instincts tend to advance certain sciences in popular estimation, and also influence teachers in their treatment of them. It is also the case that, in all countries

in which there is much wealth, the arrangements made by schools and universities for the bestowal of a liberal education, however excellent, are likely to fail; and boys and men are likely to become indifferent towards all parts of it that do not minister to their vanity or their enjoyment.

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SECTION V

EVOLUTION AND EDUCATION

THE recognition of Evolution as the mode by which the human race came to exist has reacted in various ways on conceptions of education. In recent years, the study of the nature of variation and heredity (known as Genetics), the phenomena by which we must suppose Evolution to proceed, has made rapid progress. The knowledge thus acquired limits in several ways our expectations as to the results which education can attain. That education can modify the composition and development of such a people as our own is not in doubt; but even the preliminary acquaintance with what may be called racial physiology (recently acquired) has greatly promoted an understanding both of the possibilities of modification and of the way in which these changes are actually effected by the institution of public education. The conclusions to which genetic science points run counter to many notions long popularly entertained. It was, for example, assumed both by physiologists and by laymen, that the effects of cultivation or training in the case of both animals and plants were, in greater or less degree, transmitted to the offspring, and that in the course of generations these effects would accumulate. This theory was prominently developed by Lamarck, and was adopted, with few exceptions (*e.g.* Sir W. Lawrence), by all writers on these subjects, notably by Charles Darwin. Weismann was the first to induce the world seriously to examine the foundations of this doctrine. He showed not only that the little evidence favourable to such a belief was, in reality, worthless; but also that the physiological mechanism of heredity, in so far as it can be observed, was such that the occurrence of any transmission is in a high degree improbable. The results of the modern accurate study of heredity are entirely in harmony with this negative conclusion. There is now scarcely any doubt that the

germ-cells of which the offspring are composed possess from the beginning ingredients determining their powers and attributes; and that, with rare and doubtful exceptions, it is not in the power of the parent, by use, disuse, or otherwise, to increase or diminish this total. It is not impossible that injury to the germ-cells may be effected by starvation of the parent, by excessive doses of drugs (such as alcohol), and similar violent treatment, though there is little definite evidence that even in this limited degree the destiny of the offspring can be changed; but that the development of a faculty in the parent by education or practice causes an increase in that faculty in the offspring is recognized by most students of the subject to be altogether unproven and probably impossible.

Imitation and Memory. It is true that in the last decade some have again revived the view brilliantly expounded by Samuel Butler (*Life and Habit*, 1878), and also by Hering, that living things may, through their generations, have a continuous accumulation of "unconscious memory." Just as learning to read or to play a musical instrument requires close attention and extreme effort in the early stages—though afterwards these acts may be performed almost without conscious attention at all—so, it is argued, may even the ordinary reflex actions, such as respiration or digestion, have been acquired as a summation of effort originally conscious. Such a fascinating proposition, if well supported, would have enormous consequences, and man's outlook on the world would be profoundly modified. It is, however, maintained chiefly as providing a complete account of the origin of adaptations with which no other current theory of evolution has successfully dealt, rather than by appeal to direct evidential proofs. Living things do continually display purposeful faculties which seem as if they *must* result from the inheritance of parental experience. A bird builds the nest peculiar and appropriate to its species. Conceivably, however, the bird remembers the nest in which it was reared, and copies that when its own time comes.

But insects do similar things, though the parents died when the offspring were eggs. Parasitic ichneumons, for instance, find the larvae on which their young are to feed, though hidden deep in a tree-trunk. Somehow they perceive the hidden larva, and lay their eggs in such a way that the young will reach it. Nature abounds with such examples. We can say that the "instinct" of the ichneumon is fired or let off by the perception—probably scent—of its food-larva, just as the first drop of drink may excite the craving for alcohol in the youth who inherits that vice; but that is a mere description of the phenomenon and no account of its causation. Nevertheless it must be recognized as a fact that the purposeful acts of animals are, in many cases, first made in response to external stimuli. Sometimes they are, no doubt, rightly interpreted as directly imitative of the similar acts made by the parent in the presence of the young, but unimpeachable examples of actual teaching given by the parent are rare. It has, for instance, been often reported, on fairly good authority, that diving birds teach their young to dive. The significance of the evidence must, in these cases, obviously be largely a matter of interpretation.

Fundamental instincts are evidently called into play by trifling circumstances. Chickens are sometimes said to peck up food as soon as they are hatched. That is not true; but, as every one who has used incubators knows, at about twenty-four hours after hatching, chicks make vigorous but, at first, ill-directed strokes at any small coloured or shining objects. They peck in this way, especially at each other's claws. Some hours later they acquire precision, and can seize bits of food with certainty. The instinct appears to be excited largely, if not entirely, through the sense of sight. Imitation greatly aids. A single chick may not learn to feed itself for some days, but there is no difficulty when several are together. On the other hand, the disposition to run to the hen's "cluck," which is manifested very early in chicks hatched under a hen, is not developed in incubated chicks

of similar age, who evidently attach no meaning to the sound. An apparatus is present ready to act if the appropriate stimulus is given at the right time; but for want of that stimulus, it remains inoperative. It is tempting to suppose that the apparatus, the readiness to make the right response to various stimuli, is a manifestation of "unconscious memory"; but since, as we have said, there is no good reason to suppose that even the simplest experiences of the parent are at all transmitted to a succeeding generation, the suggestion of continuous memory as applicable to education can only be defended on grounds which to the biologist are mystical and unconvincing.

Racial Modification and Education. The racial changes which may admittedly follow on the institution of popular education are seen by biologists to be produced in a very different way. One of the chief facts demonstrated by modern research is the heterogeneity of the individuals of which most species of animals and plants are composed. Conspicuously is this true of man, and of the mixed races in a very high degree. Applied for even a few generations to composite populations, universal education can effect remarkable changes by re-arrangement of the constituent members. Opportunity is given for the more intellectual individuals in the various classes of the community to improve their position. A natural selection of the intelligent from the several social layers is thus given an increased scope. By changes in public opinion, which in an educated community tends to discredit the less intelligent, the process is accelerated. As a result of this sorting process, a considerable reconstitution of the layers or classes may be effected. The intelligence of the community then seems to have been raised, and undoubtedly it may show a higher average of mental efficiency; but the alteration accrues by change in the distribution of opportunity and the selective process, not by any physiological transmission of the cumulative effects of education. Discussion often arises whether various non-European races submitted to

our education will be found capable of assimilating themselves to our mental standards. The question is raised both in reference to peoples like the Chinese, immemorially civilized, and to races of low intellectual type, such as the negro or the American Indian. Reformers and philanthropists are disposed to treat these two classes of cases as similar, and to argue that in the course of generations any race exposed to education can develop along the lines which we have followed. To the biologist, it is clear that no answer of general application can be given. The problem is special to each race, and is simply a question whether the race does or does not contain individuals capable of responding to the treatment. For, while it must be supposed that a vast country like China, among the divers races of its inhabitants, many of whom have for ages shown intellectual capacity of a very high order, may almost certainly contain human material possessing all kinds of attributes, nothing in the history of the negro races indicates even the sporadic existence of such material among them. Unless, however, the aptitude is already present, there is no likelihood that it can be introduced except by cross-breeding, and the possibility of a change in intellectual type is not essentially distinct from that of a change in colour. It must be understood that we are here considering the *capacity* of races to respond to our education—not the question whether, given the capacity, a particular race is likely to do so. Reference was made to the possibility of a change of type being effected by crossing; and, in considering any practical example, a large and very uncertain allowance must be made for the consequences of such events. As we have learnt from Mendelian studies in heredity, the results of crossing are by no means so simple as was formerly supposed. A feature or attribute may, indeed, be introduced from a foreign source and eventually become widely disseminated among a population, though the general appearance and characteristics may remain sensibly unchanged in other respects.

Intellectual Evolution. Judgments in regard to the intellectual evolution of races are further obscured by the vast changes produced solely by the exercise of the faculty of *imitation*. The part that fashion and imitation have played in the history of civilization is still imperfectly understood and by no means fully appreciated, and it is not inconceivable that these phenomena have been significant in determining the course of Evolution. (The reader may be referred to the remarkable essays of G. Tarde: *Les Lois de l' Imitation* [ed. 6], 1911.) The large physiological departures from the normal—variations in the biological sense—are rare. The bulk of the population remains of an older type: yet by the irresistible instinct towards imitation, the race, as a whole, may, to use Tarde's happy expression, be "polarized" under the influence of a few dominant minds, so as to present a semblance of uniformity which masks their real composition. Even among European nations which pass for educated, only a small part of the population really assimilates education in any considerable degree. With the majority, the process is carried but a small way, little permanent effect being produced, and signs are not wanting that the failure is due to congenital want of aptitude. Remembering this fact, that among contemporary peoples the type which can in any sense be termed intellectual is always rare, it is evident that a large ostensible change may be induced in a population by the presence among it of a comparative minority who can respond fully and readily to education. A spurious transmutation of the people as a whole is completed by imitation in its manifold forms. With the prosecution of some far more rigorous analysis than can yet be applied to human populations, it may be possible to trace with some accuracy the principles here indicated, but at present we can only recognize their operation.

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SECTION VI

EXPERIENCE AND EDUCATION

EDUCATION that aims at the fullest and best life may be said to be the control of experience. With this end in view, the environment of the pupil, his activities and interests, his games and his studies—in fact, everything connected with him—may be subjected to whatever modification the educational purpose seems to demand. Certainly, no one can avoid learning by experience; but, just as certainly, without the guidance of the educator, he is as likely to learn the wrong thing, and to learn it the wrong way, as to learn the right thing the right way. But, beyond this acknowledged and elemental fact, there are considerable difficulties as to the nature and extent of educational interference. The whole history and theory of education visibly turns round the question: What and how much is the teacher to do? Modern opinion tends strongly to the view that the teacher's function is to direct and develop the pupil's activities as against the view which reduces the teacher to an intellectual conduit at which the pupils perforce must drink.

When we are said to learn by experience, the meaning is that we learn by immediate acquaintance, and not by a communicated description. We ourselves manipulate, dissect or test, observe, and experiment with the actual object, and do not merely read about it in a book, or look at a picture of it, or listen to a verbal explanation of it. This direct experience is said to give knowledge of things and not of mere ideas or words. Educational theory has long insisted on the importance of such a first-hand acquaintance with things, and there is no lack of current maxims to that effect. We are told that things, not words, are the true mental pabulum; we are urged to present to sense, and to as many senses as possible. To give such

advice its true value, we must remember that, whenever the effort to reform abuses condenses its principle into a maxim, such a maxim is invariably open to misinterpretation if taken without the context, which furnishes at once its limitation and explanation.

Sense Experience. The maxim, "Present to the senses," means that the proper way to begin a knowledge of sensible objects is to make them actual objects of your pupils' senses. But it could never mean that sense-presentation is all that is necessary for knowledge to emerge, and this for many reasons.

Plainly, it is perfectly possible for the mind to be face to face with sensible objects, and to be to a certain extent aware of them, without being thereby educated a whit. The mind must be active; questions must be asked; problems raised; interest stimulated. In short, the function of sense-presentation is to arouse thought. Without thinking, it is impossible to learn anything from a wilderness of sensible objects. There is no water-tight division between immediate acquaintance and "knowledge about." This is just as well, for otherwise, of course, any knowledge gained from particular objects would have no possibility of connection with others like them. Education of the sort under discussion begins at the level of perception rather than at that of sensation strictly so called. For sensations are elements distinguished in objects perceived; and the child, at any rate, is aware of objects rather than of sensations. It would be a mystery to him if he were told that he has a sensation of sight; but he is on familiar ground if he sees a dog.

This process of learning, then, in addition to actual presentation to sense, involves observation, discrimination, and classification, and possibly also experiment.

Given, then, an actual object, the teacher arouses interest and suggests questions to his pupils—in short, gets them to think about it as well as to touch or see it. From this there may arise an analysis of its characteristics—it is hard or soft, round or

square, red or blue, etc. So the child learns to discriminate and to classify, for the roundness distinguished in the particular instance leads to the object being so far classified with other round objects. Discrimination is noting differences in objects. It should be cultivated by presenting at first differences which cannot be missed, and afterwards finer and finer degrees of difference. On one side, this faculty depends on the development of a mental factor (viz., judgment), and, on the other, on a physical factor (viz., sensory acuity). How far the latter can be cultivated is an interesting question. Laura Bridgman, who was limited almost entirely to the sense of touch, "developed a local discrimination of the points of a pair of compasses from twice to three times as great as that of an ordinary person." (Sully, *Teacher's Handbook of Psychology*, p. 189.) Experiment has made it extremely improbable that such improvements in discrimination are really improvements in sensory acuity. The improvement seems to be in the mental factor. So it is found, contrary to the popular notion, that the senses of savages are not keener than those of civilized people. The cultivation of discrimination finds its limit in practical needs; but perhaps too little, rather than too much, is done in this direction in general education at present. In special branches, of course, such as microscopy, discriminative ability may be of the essence of the whole business, and be developed to an extraordinarily high degree. In cases where the object is experimented with, still higher processes of thinking appear, for it becomes necessary to consider what the experiment proves. Thus, beginning from a simple perception, we find the whole mind involved.

Direct Experience in Moral Education. It is of the highest importance to remember the part which must be played by direct experience in moral education. Maxims and exhortations that apply to situations which the pupil has never experienced are of little use. Hence the notorious difficulties of moral instruction. The situation and problems

must be alive and actual. It is well-nigh impossible to convey the understanding of what duty is if there is no previous and immediate knowledge of the sort of situation in which duty arises, for it is to such knowledge that the appeal must be directed, and on it comprehension must be based, and so must the reaction which is the teacher's aim. The right action is best learned by seeing it done; the right ideal is best picked up by the beneficent contagion of example. The school-boy becomes a member of the school society—a society larger, more complex, richer in fresh situations, and, in general, more exacting than the family circle. In this simple change, then, are involved enormous possibilities of moral improvement or deterioration. That the result is nearly always improvement is a priceless achievement and justification of educational control. Naturally, just as in intellectual training the mind must not remain face to face with mere things, the moral self must not remain face to face with unexplained situations. At this point moral instruction finds its place, but never apart from direct contact with persons and actual moral situations. The beginning is in direct experience, and the end also. For morality is essentially doing. Hence the importance and value of positions of trust and responsibility which can be held by pupils, and of games which develop courage, readiness, and endurance and the habit of self-subordination on the part of the individual to a common aim. It is only by doing and doing again that the good action can be crystallized into a habit, and form part of the permanent character, ready for the sudden demand which seldom fails to come and so rarely gives time and opportunity for the unprepared.

SECTION VII

PHILOSOPHY AND EDUCATION

PHILOSOPHY, conceived as love and pursuit of wisdom, was originally co-extensive with man's search for truth. But as that search succeeded, the need for specialized effort became increasingly imperative; for neither man's intellectual powers nor his length of days kept pace with his growth in knowledge. First, the whole realm of the material world broke away, and what had been known as natural philosophy began to arrogate to itself the name of science. Gradually developing its own inductive method, it applied with ever-increasing thoroughness its fundamental postulates of uniformity, law, and mechanism. Then it extended its scope to man. So the inductive treatment of empirical data has become a recognized method of dealing with human action, both in the individual and in communities. In psychology, ethics, politics, economics, aesthetics, the movement extends. When it is claimed that such methods and postulates are appropriate to the examination not only of the material aspects of conduct, but also of the spiritual aspects—that they are, indeed, the only ones that can give real knowledge—then physical science claims to become philosophy and offers an inflexible mechanism as the ultimate explanation of all things, including human life.

To many minds, such a theory fails to explain the most intimate characteristics of experience—the intuitions of free initiative and of responsibility for its exercise, the bonds of sympathy between men; in short, all that we most definitely mean when we think of ourselves as living spiritual beings. They demand a philosophy which shall accept such intuitions as the ultimate bases of certainty; and, by developing their implications, reach an answer

to the fundamental questions as to the ultimate nature of existence and knowledge, and the relation between them. These are the traditional problems of pure philosophy in its two allied branches of metaphysics and epistemology.

To these questions the scientific materialist gives the answer we have already indicated. At the opposite pole the idealist offers the answer that not matter but mind is the ultimate reality, and that, in consequence, existence and knowledge are identical: for existence is only presence in some consciousness, either that of an individual or that of an absolute and universal mind. More recently, under the impetus to thought given by the doctrine of evolution, a new trend has been imparted to philosophy. Reality is no longer conceived as an unchanging substratum—whether material or spiritual—of the ever-changing phenomena of experience, but is sought in experience itself, as the only reality directly open to us. So life is conceived as a constant activity, and free originative power as the motive-force which uses mechanism, both in the material world and in the spiritual life, as its instrument.

The Solution of Ultimate Problems. To examine the many forms of these classes of solution of the great ultimate problems would be to write a history of philosophy. The question before us is the simpler one of how they bear upon education. In so far as they influence its practice, it is either through theory consciously applied, which obviously depends on philosophical views of the nature of life and of knowledge, or through the largely unconsciously accepted views of the relative values of the aims and activities of life that form the spiritual atmosphere in which each child lives and grows. Not as clearly held doctrines, but as attitudes of mind do the views of philosophers enter into this potently formative universe of thoughts, evaluations, beliefs, and aspirations. Its composition is complex, and the factors that constitute it can neither be indicated nor weighed with any precision. They are always changing, though so slowly

that the process is apparent only when those dominant at one period are compared with those dominant at another. Advance of positive knowledge and its applications to human purposes, estimates of practical men of affairs, products of all forms of art, religious beliefs—all are there, and they make it easier or more difficult for various philosophical theories to find practical acceptance. Those that harmonize with its general trend are received with various degrees of understanding, and through various forms of propaganda. Those that are incompatible with that trend meet with welcome from but few. So it is possible that the practical philosophy of the people, which is the most potent formative influence on the young, may diverge widely from the theoretical conclusions of contemporary philosophers. For example, Kant's insistence on an inexorable but abstract law of duty, combined as it was with an absolute divorce between duty and pleasure, had little influence on the general consciousness. In spite of Kant, education, both in theory and in practice, has increasingly left duty on one side and devoted itself to the search for the pleasant. In this it has, of course, been in agreement with other conscious aspirations of life, and the whole was in harmony with that materialistic and hedonist philosophy which was so congruent with the most powerful forces in the social life of the eighteenth and nineteenth centuries.

Yet it is obvious that on the prevalence of a true philosophy depends the value of education. Schools can make for the improvement of the race only in the degree in which their efforts are consciously directed by higher views and truer estimates than are current in the community; yet not out of touch with them, for then, as has been seen, but faint response is evoked. It, therefore, behoves all who have control of education to weigh the answers to the riddle of life offered by the great schools of philosophy. For education can be effective only when it has a clearly conceived aim, which implies decision as to the ultimate nature of life; and a clearly conceived doctrine of means, which involves

deciding whether life is a freely determined activity seeking its own ends and gathering knowledge in relation to those ends, or a mechanically determined reflex to its surroundings, passively receiving knowledge, and that mainly for its own adornment. And these are questions only to be answered by philosophy.

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SECTION VIII

PERSPECTIVES, APPRECIATIONS, AND
ATTITUDES

THE general educational purpose has been described as the purveying of "knowledge, ideals, habits, methods of work, perspectives, appreciations, and attitudes." The present article deals with those subtle and ambitious forms of the teacher's work intended by the last three of these terms. That each of the seven is exclusive of the others is not, of course, implied.

Doubts exist as to whether the average teacher should attempt such tasks at all. Religionists, for example, protest that the "religious attitude" in the child cannot be called forth by a teacher who is without religious convictions. The protest, possibly sectarian and selfish in origin, and open to an obvious *tu quoque* (for the docile denominational teacher is not more conspicuously successful in teaching religion than his undenominational colleague), has at least the merit of raising, in a definite form, the question whether subjects which depend much for their successful teaching upon the sense of an inward "call" can be taught by teachers who are appointed independently of any such call. The same question arises in connection with the teaching of appreciation generally, for a teacher's insensibility towards music or art can easily be passed on to the pupil with the addition of a positive dislike. Modern "paganism" has actually been attributed to religious education; that modern "philistinism" has its origin in our attempts to teach beauty is arguable though improbable.

It will be assumed that one solution of the difficulty, namely, reform in the administration of education and particularly in the assessment of teachers, is in operation, and that some teachers, at least, feel it "worth while" to grapple with the problem of "perspectives, appreciations, and attitudes."

Perspectives. The teaching of *space* and *time perspective* should not be very difficult, though it is so rarely attempted that most children have no idea of the relative sizes of countries, and most adults no idea whether the coal measures preceded the chalk; David, Alexander; Isaiah, Jeremiah; or Dante, Milton. Indeed, the continued neglect of time charts constitutes a small though genuine educational scandal; though a more serious scandal, everywhere winked at, is the purveying of untruthful ideas with regard to the history of the world. Every scientist is aware that man has been on the earth for hundreds of thousands of years, and that his ancestors are to be sought among the lemuroid animals of the Tertiary Period. So long as facts like these are concealed, religious education remains guilty of disingenuousness, and our unprotesting educationists, from the highest to the lowest, stand confessed as ignorant or pusillanimous. In short, the teaching of space and time perspective is the teaching of plain truth about the universe, and with a little effort and apparatus the thing could be done. A few hints must here suffice.

SPACE PERSPECTIVE. Geographical and astronomical charts and models (Western Galleries, South Kensington Museum). Sun and inferior planets (models to exact scale). Books like *Man's Place in the Universe* (Wallace). Romances of Verne and Wells.

TIME PERSPECTIVE. Its chief vehicles are *symbols*, *panoramas*, and *relics*. Space-for-Time Principle (Hutchison). Line of time (Withers, Keatinge). Geological, primitive, and historical times. Parallel lines of time. Lists printed or learned by heart: the Caesars; the American Presidents. The busts of the Caesars (British Museum). Other chronological collections. Historical frescoes. Pageants of history. Panoramic books like Gibbon (copiously illustrated, if possible). Panoramic passages: Chap. XIX of G. A. Smith's *Historical Geography of the Holy Land* (Battles in the Plain of Esdraelon, etc.); Hugh Miller's "Mosaic Vision of Creation" in *The Testimony of the Rocks*; Kappa's *Let Youth But*

Know ("Out of the depths . . ."). The two-thousand-year-old tree (South Kensington).

The main pedagogical question is whether the above apparatus should be used as apperceiving or as apperceived material. Now the visitor who, wholly unequipped with interpretative ideas, pays a visit to a museum, will acquire, no doubt, a basis for future study—apperceiving material for future acts of apperception—but his visit will otherwise be relatively uneconomical of time and effort. As a rule, therefore, some schematic or symbolic knowledge is a prerequisite for the apperception of panoramas and relics. But if time and facilities are copious, the schematic knowledge can itself be built up from panoramas and to some extent from relics. The mental process with most people is a rhythm in which the schematic and the illustrative both play their parts.

Time perspective, as some of the above examples indicate, passes into the more complex HISTORICAL PERSPECTIVE. There is, in fact: (1) mathematical time, calculable in hours and centuries (all equal); and (2) psychological or historical time, which is complicated by the varying speed at which human development takes place.

"Better fifty years of Europe than a cycle
of Cathay."

"One crowded hour of glorious life
Is worth an age without a name."

Wide knowledge and the possession of schematic or time perspective are the parents of historical perspective. Every geologist is convinced that no mammalian fossil will ever be discovered in Silurian rocks: his conviction springs from his knowledge of geology and his possession of a time scheme.

The intense interest of tracing the history of arts and ideas need not be pointed out here. Artistic invention in the fourteenth and fifteenth centuries proceeded at a breathless rate. Giotto learned how to paint with dramatic force; Paolo Uccello's place in art is indicated by his famous exclamation:

"What a beautiful thing is this perspective!" Pollaiuolo resorted to anatomy; Leonardo da Vinci invented chiaroscuro.

In the moral realm, too, ideas are born, grow, and die. The idea of witchcraft has almost died; the idea of eugenics is in its vigorous youth. Certain events could not have happened earlier than—?

Whoever can date things for himself has a sense of historical perspective, and unquestionably such dating ought to be a recognized educational exercise, in higher if not lower schools. But spiciness is added to the problem by the existence of historical rediscoveries, anticipations, parallelisms, and coincidences. Some men are born before their time; conversely, there are incredible lapses into barbarism. Though the unexpected always happens, yet history repeats itself.

VALUATIONAL PERSPECTIVE is a matter of ethics. Some things are trivial, others are important; and it should be the task of moral instruction to redress the unreliability of most men's judgments of value.

Appreciations. Only during the last few years has the necessity become obvious to distinguish between the appreciation, and the learning or technical execution, of poetry, music, painting, applied art, etc. The assumption has always been that music meant singing or playing, that art meant drawing or painting; the teacher's task has, in fact, been regarded as that of producing amateur musicians and artists. This view has been infinitely mischievous and has been perhaps one cause of British "philistinism." Plainly, most people cannot, by the nature of their occupations, become musicians or artists, though nearly all can be led to appreciate music and art. Teachers—or rather their advisers—by concentrating attention on the first, have destroyed the chance of achieving the second purpose.

Aesthetic appreciation is largely incompatible with the simultaneous solving of intellectual problems and the performance of technical operations. In spite of this, we have "taught poetry"

by presenting and explaining difficult words, and have "taught music" by means of a wrestle with printed signs; and although the "first impression" is all-important in matters of taste, we have prevented any impression whatever from reaching the aesthetic sense of the child.

The solution in the case of the teaching of poetry apparently lies in (1) *negative preparation* (removing intellectual difficulties days or weeks in advance); (2) *positive preparation* (supplying the materials on which metaphors, etc., are based); (3) vigorous, undisturbed *presentation*, on the principle of "ear before eye." In the case of music, a similar though perhaps less elaborate policy is called for; and sundry adaptations of method to subject-matter will be found necessary in the treatment of painting and the other arts.

Not only the aesthetic but also the religious problem might be largely solved by means of a *school liturgy* or scheme of celebrations, in which music, poetry, and passages from Biblical and other literature took the place of "lessons."

Attitudes. Professionally, yet not without sincerity and some educational justification, the clergy insist that the school should create "attitudes" as well as confer knowledge and skill. In particular, they champion what they call "reverence."

The psychology of attitudes has yet to be written; but, unquestionably, the attitudes of the "puritan," the "jingo," the advocate of "non-resistance," the "art for art's sake" advocate, and the like, may be the results of ideals consciously adopted as a result of suggestion or conviction, and subsequently transformed more or less into habits. Certain other attitudes may have other origins; one at least has been suggested under "Appreciations."

With regard to "reverence," it is fairly clear that no reverence can be generated amid the slovenliness of the ordinary school lesson on religion; that "first impressions" will have to be exploited more fully in the future; and that movements and ceremonials, full of stateliness and symbolism, will have to be

invented or adapted. The one reverence of the cleric, and the three reverences of Goethe, will have to ramify into thirty or more.

In this sense the school will have to "teach religion" and teach plenty of it. But it will be a religion that tells no lies, imposes no test or strain, disgusts no child with the Bible, and creates none of the dividing prejudices which, at present, some forms of religion deliberately set themselves to create.

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SECTION IX

AESTHETICS AND EDUCATION

"AESTHETIC education" suggests no particular philosophical problem, unless the beautiful is recognized to be a fundamental, original manifestation of the mind, distinct from all the rest.

Aesthetic Heresies. Clearly, if beauty is regarded merely as a case or class of the agreeable, or of that which contributes to individual comfort and happiness, its bearing on education will not differ essentially from the relation existing between education and the agreeable (or, to speak more correctly, the useful in general), and aesthetic education will simply form a branch of economic education (physical, hygienic, dietetic, sexual, etc.). Similarly, if beauty is considered to be a moral or virtuous attitude of the soul (*e.g.* inward harmony, temperance, or refinement), then aesthetic education will be but a branch of ethical education. Again, if beauty is regarded as a symbol of truth, as an ideal form of logical or historical knowledge, or as an ornament or allurement towards truth, then its treatment will come under logical and scientific education, and this alone can decide whether the educative process shall admit or resist the claims of beauty; and, if the former, how and within what limitation. In all these cases, a philosophical treatment of the problem of aesthetic education is out of the question, empirical treatment alone being possible; that is, beauty being in them reduced to a simple conception of class (an empirically-constituted group of hedonistic, moral, or intellectual facts), nothing can be said of its primary, peculiar functions, the existence of which is virtually denied by the adoption of any such conception. None but

empirical precepts can be laid down concerning the various diversions, exercises, or expedients, known as aesthetic, and their appropriateness to the age of the pupil, and to the type of education. Nay, indeed, since beauty and art thus lose their inevitability, becoming mere limited determinations in a general whole, one may even, as already mentioned, resist them, or try to destroy them or reduce them to a minimum. Thus, the educator, whose object is a physiologically healthy and utilitarian life, will condemn all lingering among the delights of the imagination; the rigid or ascetic moralist will object to the softness and sensuality engendered by the cult of beauty; the logician and man of science will disapprove of fables, which are the enemies of truth and more likely to weaken the mind and lead it astray than prepare it to receive the truths that suitable stories embody. Attempts to displace the quest of beauty have been made, as may be remembered, though, in truth, the expulsion of art from well-ordered republics, the war against beauty in the name of austere ethics, the derision of fancy in the name of intellect, belong rather to the story of pedagogical Utopias than to that of actual education and custom. For aesthetic education has always advanced unaided, even when opposed; whenever it has found one way blocked, it has taken another, and asserted itself even in those who rejected it.

The Nature of Beauty. The reason for this is that beauty or art is a fundamental, essential, and eternal function of the human mind; irreducible to any other form, being elemental; ineradicable without the destruction of all the rest whose existence it implies, being itself implied by them. Art is nothing but fancy, and what we call *beauty* is nothing but fancy rejoicing in itself—the essence of fancy; and since genuine fancy springs from our sentiments alone (our aspirations, inclinations, rebellions, affections, aversions, etc.), art may be defined as the reflected form of sentiment. In fancy, sentiments become mental images, life becomes contemplation, and the passionate impulse (which

in itself is mute) finds expression : in a word, sentiment changes into consciousness—not, it is true, into logical and historical consciousness, but rather into the spontaneous and immediate consciousness of intuition. This is the nature of art, and this its proper and indispensable function in the life of the mind : and it follows that it is, in truth, a preparation for the logical life of thought, or philosophy ; it is not, indeed, as was once believed, a sort of inferior, popular, imaginative philosophy, but, rather, non-philosophical knowledge—the world of mental images which philosophy will penetrate, differentiate, and arrange, transforming it into the world of reality and history. And since fancy and art are essential elements of the reflective life upon which activity is based, the practical and moral importance of art may clearly be said to show itself not, as was once thought, as a display of the action of examples, precepts, and utilitarian and moral stimuli, but rather in the fact that Art, while in no sense determining the mind, renders possible, by merely presenting human sentiments and passions as a spectacle, the further determination of perception and moral duty.

The Expression. Clear expression (which is tantamount to clear inward vision before statement) is art, poetry, speech, writing, drawing, music ; and, since this knowledge-expression is of essential importance to the mind, it is also a necessary part of education, which should and does strive for the development of every individual as an artist. For the word "artist," before indicating certain particular individuals or classes of individuals—so called because they possess the power of fancy and expression to an exalted degree, and are able to elaborate vast, difficult, and rare expressions, described in the strictest sense as "works of art"—signifies *man himself* : any man whatever, who is an artist because of his humanity. He is an artist even if his artistry consists in nothing more than ability to talk well of everyday life, and to give correct expression to his most simple and obvious sentiments ; and the mother and nurse train the

child for art, or expression, before the professional master. And this education is continued and extended until it reaches the highest and most complex forms of oratory, drama, painting, sculpture and music, which are all nothing but the expression of the soul of the artist—the words used by man not only in ordinary, but also in extraordinary and solemn moments. However great the artist, however intense his work, he will never derive from it any real, direct satisfaction except that of seeing his sentiment fully and clearly enfolded and outlined in word, rhythm, or line.

If this, which may be called the "productive" side of aesthetic education, is all, as it were, narrowed down to the "learning to speak" of the baby, or the "learning to write" of the child, the other side, generally called the "reproductive," is all represented in "learning to read." For reading, real reading, reading with one's whole soul, is to reproduce in oneself the picture palpitating with life, which the writer had in mind while putting his signs on the paper, and to feel equally with him the joy of beauty; and if the writer had nothing in his imagination, or only a faint, confused image, and his writing is a barren and vain effort, this poverty of spirit will be reproduced in us also, and we shall feel artistic displeasure (or the sentiment of the ugly). "Learning to read," in its broadest sense, embraces not only the modest explanation usually supplied by the teacher, but also the education of the philologist and connoisseur, the study of languages and forms of speech, experience of life: everything, in fact, which is required to comprehend the words of others, and works of art both past and present. But when we speak of the "words of others" and reproduction, we are simply recognizing conventional distinctions: what belongs to "others" is really our own; what we call "ours," belongs to others; for the individual does not exist as a mere abstract individual: he is a social being, a part of humanity and of the history of humanity; and his *reproduction* is *production*, for what he reproduces belongs to him as man, and is his. beyond

time and space, now and for ever. Thus aesthetic education, whether called productive or reproductive, like every other form of human thought and work, like every other activity, raises the individual to humanity and makes him a collaborator in the authorship of actual history.

Art and Education. This briefly outlined conception of the beautiful determines the relation between art and education. All questions hitherto raised, and all that may be raised in this connection, find solution in the nature of art, which alone regulates aesthetic education. But if the relation between art and education is thus made quite definite, the same cannot be said of that between *Aesthetics* and *Pedagogy*, which have always been regarded as *two distinct sciences*. Thus has it always been in scholastic conceptions, as well as in a celebrated pedagogical school which retains much of the scholastic—the Herbartian—in which, on the one hand, was placed a science of spiritual values, viz., Aesthetics sub-divided into Ethics and Aesthetics in the narrow sense; and, on the other, a science of psychical facts, or Psychology; and Pedagogy was the science which studied the application of the values to the facts and the modelling of the facts according to the ideas. To this conception it may be objected that we are not shown in any way how the human psyche can ever receive into itself that which it does not already contain, and which is, consequently, extraneous to it; and that a theory of application *ab extra*, instead of being a matter of education, seems rather referable to material dexterity, and would explain, at best, *not* spiritual life—the flame that feeds the flame—but that distortion of it universally condemned as parrot-like, mechanical, pedantic imitation. The truth is that education is development, spontaneous like every form of development; and the educator himself can only accomplish his work as educator in so far as he identifies himself with his pupil, making himself one with him; for, in education also, it is not the abstract, isolated individual who is developing, but concrete, universal humanity. If this conception

of education, which the modern Italian school of philosophical pedagogy has the credit of having introduced and maintained, is unassailable, the fact, or rather the act, must inevitably correspond with the essence or idea—the psyche with the mind—and the *theory of education* with the *philosophy of the mind*, which deals with the never-ceasing development of the mind, in its constant diversity from moment to moment, and unfailing unity in diversity itself. Now, fancy or art represents one of these moments, in which the mind separates itself in order to obtain unification; and that part of the philosophy of the mind which takes it as a study is known as Aesthetics. Therefore, the theory of aesthetic education cannot be included under the heading of a non-existent pedagogical science, but is identified with Aesthetics, the two being identical both as regards the problem and its solution; that is, the conception of art is identical with that of the genesis and development of art—the conception of the artistic mind with that of the education of the artistic mind—which is the unfolding of the nature of that mind.

Pedagogy and Aesthetics. Indeed, there is no question which can be presented under the form of a pedagogical question appertaining to art which, if understood rationally, cannot be resolved into a question of Aesthetics. "What position has art in education?" This question, as we have already seen, is identical with that regarding the nature of art and its function in the life of the mind, which is the general question to which Aesthetics gives the reply. "Is it better in teaching language and composition to give the preference to reading or to grammar?" This question is reducible to another, namely, whether the precepts of art originate before or after art; and Aesthetics, in dealing with this, shows that precepts and the grammatical rules containing them are systems evolved from art already produced, and, as systems, have no value apart from the things which they summarize; and, as rules, are always abstract and can never be substitutes for genius or taste, which alone are decisive

factors. "Is it desirable to confine the pupils strictly to classical works or to incite them to new, personal achievements?" Aesthetics proves that true art is always new and personal, but that the new and personal can only grow on the soil of history, the present having its roots in the past, so that the study of classic art and the encouragement of the new are not two contradictory requirements, but one and the same; sincere and serious spontaneity is, at the same time, discipline.

It may seem that, at any rate, there remains to Pedagogy, as its peculiar domain, that aggregation of rules known as empirical, which, indeed, represent the generalized experience of teachers belonging to various times and places with regard to the good and bad effects of certain practices: with regard, for instance, to the methods of correcting an excess of fancy by means of criticism, or excessive critical tendencies by invigorating the fancy; or with regard to the improprieties of, and remedies for, the excessive cult of beauty, which encourages minds to dream and makes them inert or perplexed in action; or again, coming down to details, with regard to the age at which it is suitable for certain sorts of poetry or novels to be read, or for the pupils to be taken to public galleries and museums, or to direct them to the study of modern foreign literatures, and so forth. But, granting that, it has to be acknowledged, both on the part of him who asks and on the part of him who concedes, that *Pedagogy as a philosophical science has no reality save as philosophy of the mind* and, in relation to artistic education, as Aesthetics; and that, understood in any other way, it is not a philosophical or rational science, but an empirical science, or rather pseudoscience. And it is peculiar to the empirical sciences, and to the aggregation of their dicta, that they are just as useful as guides and indicators as they are unsuitable for the purposes of reasoning and drawing conclusions, which always require, in place of science, a reference from those dicta to the philosophy of the mind: in this instance, to Aesthetics; just as, to do

practical work as an educator in the single cases given, it is necessary to deal intuitively and directly with the single case, illuminating it with rational knowledge: in which, that is, in practical individualization, are to be found, as every one knows, the efficacy and excellence of the educator.

SECTION X

METHODOLOGY

THE fact that professional teachers use method in their instruction goes without saying. Many have worked out their own methods, others have adopted methods they have seen in successful use, whilst in most cases, probably, teachers are following methods that are partly original and *ad hoc*, and partly borrowed. In deciding upon what methods he will employ, the teacher thinks both of the subject and of the pupils. Hence, he teaches mathematics in a different way from history, and modern languages in a different way from both. Similarly, he knows that a method that would serve admirably for a fifth form would not suit the preparatory school boy, and his courses in the sixth standard will not follow the same plan as those in the kindergarten, or in the third standard.

But while methods of teaching will vary with the subject and with the relative development of the pupils, there are certain general principles at the back of all methods that give them a common character. There is not much in external appearance to connect the water power used to drive a mill and the weights that drive a grandfather clock. Yet both are applications to different problems of the general principle of gravitation, and it may well be that the schoolmaster's course in nature study and in history, different as they are in form and detail, rest upon common principles diversely applied. This study of the underlying principles of all teaching methods, properly so-called, is what we mean by methodology.

As in physical science, so in education, these general principles have been differently conceived from age to age. Gravitation was at work before Sir Isaac Newton, and in practical life many useful applications were made of that principle before its

scientific formulation was achieved. So in education, much good work was done before principles of method as we now understand them were laid down. "Spare the rod and spoil the child" was a general precept, perhaps the leading one, in the methodology of the schoolmaster until very recent times. Starting with a belief in the inherent wickedness of man, it is an easy step to the doctrine that the schoolmaster's first duty is to drive the devil out of his pupils. In mediaeval art, the rod is the unfailing symbol of the pedagogue.

Methodology of Comenius.—In the modern sense of the term, however, Basedow and Pestalozzi were the first methodologists. It is true, of course, that both were inspired by Rousseau, and that in the seventeenth century Comenius had (in his *Great Didactic*) made pioneer contribution to educational methodology. He had dimly apprehended the Baconian principle of induction, which requires general statements to be based upon the critical examination of particular instances, and in his Latin school books he made a crude attempt to apply that principle to a practical situation. But Comenius had a keener eye for fanciful analogies between external nature and his pupils than real insight into the mind of the schoolboy. Nevertheless, he arrived at many half-truths, which might have meant a great step forward in educational practice had he not brought himself and his doctrines into discredit by association with theological mountebanks, who made the fullest use of him. His ten universal principles of instruction frequently find an issue in psychological conclusions that are sound enough as intuitions, especially if we read into them all that his words now suggest. It is the naïve analogies upon which his inductions are based that reveal the weakness of the "methodology" of Comenius. Thus the seventh of his principles runs: "Nature compels nothing to advance that is not driven forward by its own mature strength." We see this in the fact that chickens leave their eggs only when their limbs are fully formed, and trees do not drop their fruit

until it is ripe. It follows, therefore, that nothing should be taught to the young unless it is not only permitted, but actually demanded by their age and mental strength, that nothing should be learned by heart until it is understood, and nothing should be given to boys to do until it has been fully explained. From similar analogies with animate and inanimate nature, Comenius finds that the study of things should precede the study of words, that instruction should be given as tersely and clearly as possible, that the desire to learn should be stimulated, that we should teach only those things of which the practical use can be easily shown. Valuable as these general precepts of method are, at best they constitute a code of rules based upon comparisons with irrelevant, and therefore unconvincing, objects. They are in no sense a unified doctrine derived from the accurate analysis of the situation, such as we expect a methodology to offer.

Methodology of Pestalozzi. Pestalozzi's procedure was different. He saw that any general principles of method must be arrived at by unlocking the secrets of the mental processes of the learner, working not of course *in vacuo*, but upon the actualities of life. He attempted to solve this problem by laying bare the primary elements from which all thought content is derived, and by getting at the nature of the processes involved in "working-up" these elements into actual mental content. He found these ultimate elements to be sound, form and number, and the process of working-up to be inductive in character, the advance being made from what he called *distinct*, through *clear* to *definite* ideas. Putting this into more modern terms, Pestalozzi's psychological analysis led him to insist upon the importance, for mental development, of (1) the distinct apprehension of single objects, distinct ideas. This, he thought, involved knowing the name of the object, its form and its oneness—sound, form and number; (2) experience of the same objects in various contexts, thereby increasing our detailed knowledge

of the objects (clear ideas); and (3) the comparison of these various presentations of the objects, enabling us to distinguish essential from accidental or occasional features, and so to arrive at definitions of the objects (definite ideas).

Using the analogy of plant development, he further pointed out the continuity of the process of development, and the scarcely perceptible steps in the advance made.

Here in brief we have the fundamental principles of Pestalozzi's "Elementary Method," as he called it. The term has often been misunderstood, as if it meant the method of elementary instruction. On the contrary he regarded it as applying to the teaching of all subjects, and to the teaching in all types of schools. The problem of the different subjects was a problem of so arranging the matter that it was adapted to what were for him the laws of mental growth, and he planned a complete series of school books on these lines. Thus he had achieved a methodology.

But Pestalozzi's psychology was faulty, and his practice was often a wooden and pedantic application of bits of his doctrine without reference to the rest. That, however, does not concern us. We may note that although he worked out his elementary method chiefly as a problem in intellectual education, he tried to apply the same procedure, *mutatis mutandis*, to physical and moral education. Apart from the fundamental error involved in this three-way approach to the problems of an educational methodology, a scheme based upon the analysis of the process by which we arrive at a definition could hardly be made to apply to the development of moral feeling or to the right ordering of physical exercises, and all the ingenuity of Pestalozzi and his followers failed to accomplish the impossible.

Methodology of Herbart. Herbart, who owed much of his interest in education to Pestalozzi, was more successful in establishing a methodology of educational practice. He was careful to avoid the error of appearing to sunder human

nature into three separate compartments. Mind is an indissoluble unity, which in the adult takes the form of what we call character, and the importance of education comes from its being a character-forming agency. In other words, morality is the final aim of education. But morality means a completely enlightened will, and right-willing itself is the consummation, as it were, of many-sided interest, and many-sided interest is to be the object of instruction. It follows, therefore, that the organization of curricula and the methods of teaching must be determined by the conditions of development of a many-sided interest.

From the educational standpoint, the emphasis laid upon instruction is the chief feature of Herbart's psychology and methodology. Defects of character are due to defects in the circle of thought, and this may be avoided by schemes of instruction which are at once interesting, embracing and well-knit.

Herbart's own writings are too philosophical for the practical schoolmaster. His followers, notably Ziller, have reduced his abstractions to practical shape, sometimes extending his teachings almost beyond recognition. To them we owe the popularization of the "formal steps" in instruction and the working out of curriculum on the two principles of *concentration* and *culture epochs*. Although, in a large sense of the term, the theory of the curriculum is included in the methodology of education, it is not usually so treated. The "formal steps," on the other hand, and the principles upon which they rest, constitute the essence of the Herbartian methods of instruction. These steps are five in number: a preliminary step, in which the teacher's concern is to make active in his pupil's minds those ideas that relate most closely to the matter in hand (preparation); followed by three others that form the logical approach to a general notion or principle (presentation, comparison and generalization); and concluding with the deductive application of the general principle to individual cases (application).

Steps one and two (preparation and presentation)

constitute the first period of the lesson. The preliminary awakening of related ideas has culminated in a state of expectancy which is favourable to the right apprehension of the new matter to be offered in the presentation stage of the lesson. When this new matter is clearly apprehended (apperceived), it is ready for the logical treatment which is to follow.

On the side of the teacher such a scheme involves, first of all, the determination of the principle (step four) the intelligent application of which is to be the consummation of the lesson. This principle gives unity to the lesson, and makes what is called the "Method-whole." As thus conceived, the lesson may cover several time-table periods.

A scheme of this kind is obviously applicable to all those lessons in which a general principle, a rule, a definition, etc., can be inductively approached and deductively applied. It is in fact the ordinary procedure of an inductive lesson, such as we are familiar with in mathematics, science and grammar. Much ingenuity has been spent in trying to fit historical narrative, geographical description, and even art into the same Herbartian framework, but generalizations in such branches of knowledge cannot be reached by school children, and the five formal steps cannot, therefore, apply to instruction in such subjects. Although Herbartian doctrine seems to have dominated school practice in America, and although it had a certain hold in our own country for some time, the development of modern psychology, and, even more than that, the advance of the biological point of view in education, has brought us sounder foundations for our teaching methods.

The Activity Doctrine. In justice to Froebel we may fairly credit him with anticipating, through his intuitive grasp of child nature, these later doctrines. "Learn by doing" was the central principle of his methodology, and his "Come let us live with our children" was his most important practical injunction to teachers.

Activity, movement, life—these are the chief points of the new methodology. "Children do not come to school to be prepared for life, but to live." We learn to live by living, and the most striking feature of human life is its purposefulness. Deprive a man of the power of purposeful action—of working, that is to say, for ends of his own, self-chosen, self-initiated, self-directed—and he loses his manhood. He is at once enslaved. *Mutatis mutandis*, this is equally true of children. By reason of their bodily weakness and their inexperience, limits to freedom of action must be set, and school is designed to provide certain protective agencies which make freedom a possibility. It is not a prison-house in which children are prematurely drilled into habits and "knowledge," which will be useful in later life, but a society in which service and responsibility are the chief motives for effort.

Such a principle is not of course contrary to the Herbartian formula of instruction. It is at once deeper and wider. It accepts "morality" as the final aim in education, but rejects the view that morality is a purely intellectual product. It does not exclude instruction, and would even make use of the Herbartian "steps" when an inductive procedure is applicable, but it seeks a motive for the effort to learn in the life of the pupils, in its internal and external relations, rather than in the ingenious *ad hoc* preparation stages with which the Herbartian opens his lessons.

This biological conception of method in schools is in practice not new. Good teaching in the past has always owed its goodness to its vitality. Pestalozzi, Froebel, Herbart, whose doctrines we find defective, were not bad teachers because they did not see the fundamental principles that found expression in their work. Recent biological conceptions have thrown a new light on educational procedure, and new analyses are possible. But this is not of merely academic interest. The importance of new analyses always lies in the fact that they make new synthesis possible, and, in

point of fact, new programmes of work, new special methods, have sprung up in great quantity, just because the school situation has been freshly diagnosed.

The principle of activity is perhaps too broad to give very definite guidance to the teacher. If mere activity would serve, children might be left to educate themselves. Society hands over its children to professional educators who are or should be skilled in directing this activity into educative channels. Their pupils should leave them active as ever, but capable of applying their energies to some form or other of public service. This implies considerable development of the powers both of body and mind, and a desire to make the best use of them. Hence a methodology based upon activity must consider in some detail the conditions favouring mental and bodily development. The importance of the latter has been recognized in recent years by the establishment of a national school medical service, and the principle of activity in education has been greatly reinforced by the study of bodily or physical hygiene in school life. But the biological claim is not met by putting Swedish drill into the time tables in order to counteract the effects of wearisome hours spent in dual desks. Radical change in the way of school furnishings and in the way in which school subjects are attacked is necessary before the methodological ideal can be reached.

In the last resort the individual is a unity and not a mind in a body. It is convenient to think of bodily needs independently sometimes, but only in so far as it becomes a more efficient instrument of the mind can the body be said to have needs. A sound mind in a healthy body is a useful figure of speech, but when it leads to a separate hygiene of body and mind, it is apt to lead to that notion of balance that would allow school children to pass from the meaningless effort to commit to memory lists of exceptions in Latin syntax to a similar meaningless grind at "joints" in the woodwork room, on the ground that the one exercise trained the

mind and the other the muscles, although in neither case was the "whole pupil" present at the exercise.

This divorce between mind and body is especially dangerous in the earlier years of school life, because mental development has its foundation in bodily movement. The mind of the young school child is dominated by percepts and images and impulsive responses thereto. The mind of the adult with his linguistic powers may be occupied with verbal symbols that have no relation to his immediate surroundings. Between the two a great gulf is fixed and the methods of the teacher must conform to the laws that govern its passage. In other words methodology must consider the psychological outcome of activity, and select such activities as will first of all strengthen the child's hold upon his environment, and enable him to give it a provisional interpretation, then lead him to a view of the world beyond, and so put him in the way of seeing himself and his immediate surroundings in their relation to the general scheme of things. This involves the psychology of perception, imagination, conception and judgment, as the intellectual processes accompanying or developing out of activities that begin in instinctive impulses and ultimately reach the level of clearly conceived purpose.

Bound up with this twofold problem of the relation of the curriculum to the development of intellect and purposefulness is that of the growing complexity of the pupils' emotional life. Methods that leave out of account the conditions under which emotional systems are formed about particular objects, are likely in the long run to prove disappointing. These then are the points at which psychology makes its contribution to the principle of method in education. It is, however, psychology approached from a definite standpoint. Its problem is the genesis and development of intelligent purposefulness in an individual who desires to play a helpful part as a working member of society.

The reaction against nineteenth century individualism and against over-intellectualized psychology

has had a noteworthy effect upon educational methodology. Man is a social animal. He is fundamentally a co-operator. His whole civilization and culture is a co-operative product. The social constitution of man has in recent years received more definite recognition in educational practice. The "Play-way" is one form in which the social idea finds expression in the schoolmaster's devices. That children develop best in an atmosphere of mutual helpfulness; that if schools are to be a training-ground for the best kind of citizenship they must make service a leading feature of their organized life; that methods of instruction should rely largely on the social motive—all these are sufficiently recognized principles of modern pedagogical practice directly traceable to the fuller understanding of human nature and human society. The psychology of the individual is being re-written, and the educative process is being fundamentally revised with the steady advance of the idea that within the indeterminate limits of his hereditary endowment it is the inter-play of social forces that produces the individual. The complex needs of human society demand a great variety of individual service. Special endowment of every kind is potentially a social as well as an individual asset, the realization of which is one of the objects of education. Not to force into a common mould but to encourage a capacity in any direction that may be socially valuable is, therefore, an important corollary to the general doctrine.

Psychology as such has no voice at present in defining the precise nature of the service which society asks of its schools. The problem of determining the measurable outcome of school life is not yet satisfactorily solved. Examinations have many shortcomings. Practical intelligence, thoughtfulness and insight are difficult to assess in a short sitting. Yet it rests with the schoolmaster and those who control him to settle what special equipment is best calculated to give a boy or girl a satisfactory start in the school of life, but the problems of the relations of the curriculum to

social needs is not strictly speaking a methodological inquiry. When that problem is provisionally settled, the schoolmaster is required to accomplish his task in the most economical manner. The economical use of energy both in teaching and learning depends ultimately upon a sound psychology. The study, for example, of economical methods of learning by heart, of the place of rhythm in work, of various methods of learning to read, are all concerned with this question of economy. Accurate psychological analysis will often spare disappointment in experimental inquiries of this kind.

Here we are brought up against problems of special method. In general we may say that the special method that is most economical of the pupil's time and energy in attaining the object is the right one, though this may and will vary according to the temperament and skill of the teacher. A delicate instrument coarsely handled is useless. Special methods must then vary from subject to subject, and from class to class, even from child to child, though analysis of the nature of our special object may bring out common characteristics in all these methods. Sometimes we are concerned chiefly to fix habits, and the principles of habit formation will apply; in others we wish to lead our pupils to observe and discover facts and their relations to one another when the fact of observation itself needs analysis, or we may be trying to lead our class to arrive at some general principle, and its application, in which case our methods will be a particular application of logical principles. In all cases some effort, even some drudgery, on the part of the pupil is called for, but drudgery willingly undertaken for an intelligible purpose is not inconsistent with the principle of vitality. Teaching means inciting to learn. The pupil's response to the teacher's effort constitutes the educative movement in the teaching process.

Zeal for a new methodology has led to many bitter attacks upon traditional schools and schoolmasters. They are alleged to have taught useless

things by choice, as affording a mental training that would tell later on in any calling. The critics of this doctrine of formal training deny that spread of power of the kind suggested takes place, except in so far as there are common elements, connecting the one activity with the other. A fuller discussion of this controversy will be found elsewhere, though here it may be noted that in all cases there is one important common element that is often overlooked, viz., the personality of the pupil. The biologist might point out in this connection the fundamental importance of engaging the whole mind of the pupil in the work of the school. Although it would be bad methodology that ostentatiously chose a side-track in human culture for his educational instrument, thereby engaging his pupils upon activities remote from practical interests of immediate value and importance, the error would be minimized if the side-track were made a vantage ground from which wide vistas of the world were opened to those who were following it.

Whatever the subject, "the letter killeth, the spirit giveth life." This is a classical expression for the principle of "vitality" in education. The most modern curriculum may in practice and in spite of itself, be reduced to formalism, and be as deadening in its effects as the worst grammar grind that ever afflicted our schools.

SECTION XI

THE DEVELOPMENT OF REASONING IN CHILDREN

REASONING may be defined as the process whereby the mind passes from one or more judgments (called the premises) to a new judgment (called the conclusion), which the former are seen to imply. The psychological nature of this implication is obscure. The mind may be regarded as controlled throughout its procedure by what may be described, according to the epistemological standpoint adopted, either as *a priori* logical principles ("laws of thought"), or as empirical conventions and habits assumed to be conducive to true knowledge. Except in its most primitive forms, reasoning is impossible without symbols—such as words, figures, diagrams, etc.—which represent objects of thought and their relations, and which enable attention to be focused upon highly abstract or highly complex aspects of experience. The classical example of reasoning is usually cited in the following so-called syllogistic form: "All men are mortal; I am a man; therefore I am mortal." The instance, though time-honoured, is misleading. Reasoning, as a psychological process, seldom commences with a major premise. Indeed, major premises, even where logically implied or assumed, are as a rule suppressed. Reasoning is instigated by a problem, commonly formulated as a question. The conclusion forms the answer to this question. And the whole process, so far from being purely cognitive (or intellectual), has a strongly conative (or purposive) element running throughout. A specific interest starts and sustains every train of reasoning. Further, in the initial discovery of the problem there is a marked emotional element, mildly unpleasant or unsatisfying; and the emotional element is equally marked in the discovery

of the solution, being then somewhat of an aesthetic character, mildly pleasant and satisfying. The whole process may perhaps be regarded as an acquired reaction to a mental conflict, largely developed from, and motivated by, an inherited instinct—such as the hunting instinct, with its correlative emotions of curiosity and wonder, operating in a highly modified and sublimated form.

The Nature of the Reasoning Process. In the reasoning of the child these purposive and emotional aspects, due to instinct and interest, are vividly accentuated. The realization of this fact has recently begun to tinge with a practical and concrete colour the teaching of abstract subjects, such as algebra and trigonometry. Before expecting a child to reason, we now require that he should see the difficulty which demands the exercise of reason; and express that difficulty clearly in the form of a question. He should watch that his final conclusion really answers the question with which he set out, and so solves the difficulty which first aroused his interest.

Reasoning, then, like every mental process, is a reaction to a stimulus, a response to a situation. It proceeds by association; and may be regarded as characterized by associations of a particular type, peculiar to man as distinct from other animals. In the first place, the successive thoughts or images are not recalled haphazard through free association (as in reverie or day-dreaming); their reproduction is controlled by the "determining tendency" (*Aufgabe* or "task"), which initiates the whole process. Further, in the most explicit forms of reasoning, we seem immediately to apprehend, not only the ideas or objects associated, but the relations between them—the manner in which they are associated. In judging "A is to the right of B" (or "is similar to B"), I can in succession attend to and perceive not only A and B, but also the relations between them; similarly, in judging "B is to the right of C." From two such propositions, I proceed to infer—"A is, therefore, to the right

of C." In so doing, I apprehend the whole relevant system of space-relations of which A - B and B - C form part; and "see" (as we say) that the first two relations, falling within this system, necessitate the third and last. It is the inability to perceive relations, and the consequent confinement to chance associations due to contiguity in time, or to partial identity between percepts, that renders animals incapable of reasoning. In the child, the growth of reasoning consists essentially in the development of the former capacity out of the latter.

The more primitive forms of reasoning are based upon association by similarity. This does not mean, in the simplest cases, that the immature reasoner is aware of the similarity, or attends to similarity, as above suggested; but simply that the second object perceived, in virtue of its partial identity with, or resemblance to, the first excites, as a whole, the same neural system as was previously excited by the first object. The inference is thus implicit, not conscious. A child of 2 or 3 who has been ill-treated by a person characterized by some striking peculiarity (for example, short stature) will turn away in dislike from all other similar persons. Later, at the age of 4, he may, like the child in the Worcester collection (*see* below), explain that he expected C D would be cross, because she was short like his cross nurse A B. The child here argues, not from the particular to the general, nor from the general to the particular, but from the particular to the particular. Such "reasoning by analogy" is perhaps the commonest feature of the child's first intellectual efforts, as it is of the intellectual efforts of the savage. This is one of the results that emerge most clearly from the early collections of children's reasonings. The process leads to unexpected deductions, such as that drawn by the little boy who said that he was 6 when he stood on his feet, but would be 9 if he stood on his head, because 6 upside-down makes 9; or that implied by Sir John Lubbock's little girl, who said to her brother: "If you eat so much goose, you will get silly"—an inference which might be

closely paralleled by many a savage custom. Many of these analogies consist in little more than ignorant play upon words. Stanley Hall's inquiries found children who believed butter came from butterflies, grass from grasshoppers, and kittens from pussy-willows. It was this analogical character of children's reasoning that suggested the test now known as the "Analogies" test, where a relation discerned between two given terms (*e.g.* black-white) has to be applied to a third term (*e.g.* bad) to deduce a fourth term which is not given.

The earliest studies of reasoning processes in children consisted in collecting observations either from large numbers of children of different ages (for example, the 500 records gathered in the Worcester State Normal School, Massachusetts), or from one or two children closely observed during their early development (for example, Professor Sully's *Studies of Childhood*). Later investigators, beginning in this country with an inquiry of Professor Holman and the Child Study Society, employed tests involving problems either in arithmetic or in everyday matters.

Experimental Investigations. The interest in tests of general intelligence gave a new impetus to reasoning-tests. An investigation attempted by the writer, for example, showed that tests of reasoning—such as finding opposites, working out analogies ("rule of three" in words), criticizing absurdities, inserting missing words in a mutilated argument (*e.g.* the opening paragraph of Bacon's *Essay on Revenge*), drawing conclusions from premises stated in syllogistic form—gave a far higher correlation with general ability than the older tests of simple sense-perception or simple motor activities.

Experimental investigations, however, carried out by means of tests such as those specified, are still urgently needed. The following are perhaps the more important of the conclusions so far reached.

All investigators are agreed that the reasoning efficiency of children develops progressively with increase of age. There have been, however, scarcely any inquiries carried out with a large number of

problems upon a large number of children representing a large range of ages, in order to determine in what precisely this development consists. The samples appended to this article illustrate the type of problem an average child may be expected to solve at each age. It will be noticed that the difference is quantitative rather than qualitative. The development of reason does not consist in the successive comprehension of one type of inference after another. The appreciation of a given logical form does not emerge at one definite age or stage. Rather the development consists in the power to co-ordinate an ever-increasing multiplicity of data in a single systematic whole. A problem appropriate to age 7 may be made appropriate to age 14, not so much by altering its form, as by increasing its complexity. An analysis of children's compositions and essays yields a similar result. They pass from simple disconnected sentences to sentences joined by "and"; later, temporal conjunctions are introduced ("when," "while"); then casual ("because"); later, still conditional ("if," "although"). Interest passes from motive ("what for?") to cause ("why?")—at first, anthropomorphically conceived ("what makes it do so-and-so?")—then to mechanism ("how?") and, finally—if at all—to predisposing and exciting factors duly distinguished. This, however, is not because the child is incapable of appreciating causes or conditions at an earlier stage; but rather because he has difficulty in attending to such a complexity of relations as causal and (even more) conditional conjunctions imply. Almost all the mental mechanisms essential for reasoning appear to be present before the child leaves the infants' school (*i.e.* at the mental age of 6 or 7, if not earlier). Development consists chiefly in an increasing interest, extension, refinement, and control in their employment.

Many observers state that the development of reasoning is spasmodic rather than uniform. Hancock, for example, found errors in arithmetical reasoning decrease most rapidly at 9, 13, and 15,

Between these stages he often detected an actual loss of power. The approach of puberty is marked by an accelerated development of spontaneous intellectual activity, manifested in the increased interest in puzzles—mechanical, geometrical, and linguistic—and in other forms of intellectual play. About the age of 12, too—somewhat earlier in girls, somewhat later in boys—the critical spirit enlarges. The curve of doubt, disbelief, and argumentation begins a very rapid rise. At first this spirit insists only upon a single test of validity; even as far as the seventeenth year, a single coincidence is readily accepted as a proof among well-educated adolescents. Many never pass beyond this stage. Mathematical tests in secondary schools suggest that an increase in logical activity at the stage of mid-puberty is accompanied by a decrease in mechanical accuracy. Older writers connected this enlargement with the accelerated development of the “association-fibres,” particularly in the frontal and parietal areas of the brain-cortex. Wernicke, for example, noted a marked increase in the medullation of the systems of “nerve-fibres” at the age of 12. Very little, however, is known of the physiological basis of intellectual activities. The true cause of the development is probably to be sought, not in the sudden ripening of a new faculty, but in the heightened interest in and extended use of a pre-existing capacity, suppressed hitherto by the authority of school and home, and now called into play by increased freedom and independence.

Individual Differences. All investigators have been struck by the wide range of individual differences. In a random sample of a thousand London elementary school children aged 10, the brightest proves able to solve problems which can only be answered by the average child of 14; the duller is unable to answer those which can ordinarily be solved at the age of 6 or 7. Since the tests employed are constructed so as to depend as little as possible upon any special fund of learning or form of skill, acquired at school or at home, the differences may be regarded as for the most part innate. Education

still tends very largely to ignore these peculiarities. It leaves them untrained, unexploited, unexplored. Dull children are confronted with problems and methods of reasoning that are well above their intellectual level, often above any level they can ever achieve. Bright children do not receive material sufficiently hard, complex, varied, or progressive, for them to advance at the speed of which they are capable. Several writers attribute the temporary decline of reasoning powers to premature forcing of immature individuals, and to insufficient exploration and utilization of the powers of the more mature. Of all practical corollaries drawn by different investigators, this criticism is perhaps the most important and the most constant.

Sex Differences in reasoning are small. This conclusion is reached by nearly all investigators who have applied tests of reasoning to children of both sexes. "There is no general superiority on the part of the male sex, as is often asserted. Rather, specific instances of masculine superiority are counterbalanced by specific instances of feminine superiority" (Cohn and Dieffenbacher). "On the whole, the resemblances between the sexes are far greater than the differences" (Bonser). Practically all inquiries have disclosed a superiority on the part of the boys in mathematical work, especially in mathematical reasoning. In scholarship examinations where mathematical papers are included, it is found that female scholarship winners gain fewer marks in arithmetic than male, but more in literary papers. A recent analysis of replies sent in by members of the inspectorate in Scotland, where mixed schools are more general, indicates that the difference depends largely upon extrinsic factors—differences in interest, in teaching efficiency, in standard of work required, in the time devoted to the subject, and in the curriculum generally: but that it is, nevertheless, to a small though discernible extent, due to inborn peculiarities, which reveal themselves increasingly with increase of age. According to several of the

correspondents, the arithmetical inferiority of the girls is more marked in problem work, in adopting new methods of analysis, in intellectual initiative and enterprise, in reasoning by progressive logical steps; but in other respects (in accuracy, memory-work, mechanical routine) they are equal to the boys, if not superior. An extensive survey with psychological tests shows that these peculiarities very largely characterize the reasoning of the two sexes in non-scholastic work generally. The differences fluctuate somewhat with age. Before the age of 7, no differences in reasoning power are discernible, except such as may be directly due to the girls' superiority in the appreciation and use of words. From 7 to 11 the boys are slightly superior. Towards the age of 13, girls are temporarily superior. As adolescence is completed, the male sex again becomes superior. The differences, however, are very largely due to differences in the traditions and experience of the two sexes. Further, in different aspects or elements of reasoning, the sex-divergences are differently manifested. Where the solution of a problem depends upon grasping the meaning of words or expressing meaning in words, girls are favourably handicapped, though their solutions are apt to be wordy and diffuse. Where the problem is presented in mechanical form (e.g. in reasoning out the working of a piece of apparatus), the boys surpass the girls. Girls excel in the imaginary construction of situations or concrete hypotheses, in jumping to presumptive conclusions, in patient and persevering analysis, in attention to minutiae and detail. Boys tend to be more methodical in thought and more critical in their inferences. (An examination of the differences in reasoning power between the two sexes, as compared with the differences manifested in other mental functions, will be found in the *Journal of Experimental Psychology* Vol. I, Nos. 4 and 5, especially pp. 375-378.)

The Influence of Education upon reasoning is difficult to determine. One of the earliest investigators concluded from his tests that "education

improves this faculty, grammatical and mathematical studies both telling their tale." The doctrine of the limitation in the transference of improvement due to practice—a doctrine now generally received—stands in strong antagonism to such a view. Reason is not a simple faculty to be trained by repeated exercise in the special gymnasium of mathematics or grammar. It is a highly complex function of the mind working as a whole, quite as much as through special capacities. Very largely it depends for valid results upon a definite technique—a habit of methodically forming and testing conclusions, and avoiding common fallacies—a technique or habit which admits of formulation just so much as the principles of literary composition, and which is doubtless teachable to much the same extent and by much the same means. The invalid reasoning of the young child is due not as much to the immaturity of a slowly developing faculty, as to the limitations in its knowledge, in its experience, in its environment, in its familiarity with language as an instrument of conceptual analysis and synthesis, in its power to organize or integrate a multiplicity of percepts and ideas into a complex systematic whole, and finally in the practical needs which force mental constructions to conform to objective fact rather than to subjective fancy. Present systems of instruction endeavour to teach reasoning through but one or two kinds of subject-matter, which are highly abstract, and remote from the concrete daily experiences and interests of the child himself. An inquisitive and independent child will learn more of reasoning from reading well-written detective stories, investigating machinery, reproducing conjuring tricks, arguing with another companion or debating in class—especially if the topics be widely varied—than from all the mathematical lessons of his whole school career.

Graded Tests exemplify the type of material that may be used for testing reasoning, and probably for training it; and at the same time, illustrate the average level to which the reasoning powers attain

at the ages specified. Each problem is taken from a set of five, which, in turn, are selected as answered by approximately 50 per cent. of ordinary town elementary school children at the several ages—

" 7 years. Kate is cleverer than Mary; Mary is cleverer than Jane; who is the cleverest—Kate, Jane, or Mary?

" 8 years. I don't like sea voyages; and I don't like the seaside; I must spend Easter either in France, or among the Scottish Hills, or on the South Coast. Which shall it be?

" 9 years. Three boys are sitting in a row; Harry is to the left of Willie; George is to the left of Harry. Which boy is in the middle?

" 10 years. There are four roads here. I have come from the South and want to go to Melton; the road to the right leads somewhere else; straight ahead it leads only to a farm. In which direction is Melton—North, South, East, or West?

" 11 years. Where the climate is hot, aloes and rubber will grow; heather and grass will only grow where it is cold. Heather and rubber require plenty of moisture; grass and aloes will grow only in fairly dry regions. Near the river Amazon it is very hot and damp. Which of the above grows there?

" 12 years. Field mice devour the honey stored by the humble-bees; the honey is the chief food of the humble-bees. Near towns there are far more cats than in the open country; cats kill all kinds of mice. Where, then, do you think there are most humble-bees, near towns or in the open country?

" 13 years. 'Iron nails will not float in a pool. A cup of pure gold dust weighs nearly twenty times as much as a cup of water of the same size. If you drop a silver sixpence or a copper coin into a puddle, it will sink to the bottom. A cubic inch (about a tablespoon) of water weighs less than half an ounce. A cubic inch of brass weighs over two ounces. A leaden

weight will drop to the bottom of the ocean.' Sum up all these observations in one short statement of the following form: 'Most . . . are'

"14 years. John said: 'I heard my bedroom clock strike yesterday ten minutes before the first gun fired. I did not count the strokes; but I am sure it struck more than once, and I think it struck an odd number.' John was out all the morning; and his clock stopped at 5 to 5 the same afternoon. When do you think the first gun fired?"

Additional tests will be found in the articles cited below from the *Journal of Experimental Pedagogy* and the *British Journal of Psychology*.

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SECTION XII

THE INDUCTIVE METHOD

IN using the deductive method we lay down general principles or rules, and proceed with their help to particular instances. The teacher furnishes the child with these general rules before he calls upon him to apply them to problems or examples. Before the child attempts a sum in arithmetic, or a sentence in a French exercise, he is referred to the rules of arithmetic or of French grammar which he is to employ. The rule or principle is treated as if it were something which existed before the instance.

In the method of induction, however, we start with the particular instance in which we are to trace the operation of the general rule. For example, we may determine by actual measurement in a particular case the fact that if, in either of two triangles, two sides and the included angle are respectively equal, the triangles are also equal in other respects. It is sometimes said that we go on to infer the general principle from its occurrence in the particular instance; that, for example, we infer the equality of the two triangles in question from the results of our measurements. But this is not the whole of the truth. The general principle is not merely inferred as something separate from the particular instance. Rather, the instance is the ground where we meet the principle face to face.

Special Application in Teaching. Hence the inductive method in education has for its purpose to substitute for a knowledge of general principles embodied in symbols, an *intuitive* knowledge of general principles as they are embodied in particular instances. Observation and experiment, therefore, are not subordinate processes; they are involved in the intuitive attitude. The child who weighs one substance in terms of another, through his handling of the scales, is in actual contact with the operation of gravity.

But he has not to observe or to experiment without some guidance as to the directions in which he is to seek his results. He may even be furnished with the rule of which he is to discern the illustration. But the rule is not treated as something already sufficiently established. It awaits verification or realization in the particular instance. The intervention of the teacher is not like that of an external authority who furnishes principles to be taken on trust. He is rather a friendly guide who indicates the road along which we may profitably journey. So far as, in the inductive method of teaching, the result of the enquiry is anticipated, so far as the teacher's guidance is complete, to that extent the case differs from the scientific induction which discloses hitherto unknown principles. But even in scientific research, we usually start from what is already known; we have some clue towards the object of our investigation. Each fact enters into a large number of relations with other facts, so that the mere enumeration of these different relations would hinder rather than help us, unless we could disentangle what is of importance for our purpose. The term "heuristic," therefore, as applied to the method of induction is a misnomer. Our object is not so much to teach the child to discover fresh principles, as to help him to select those aspects of the object before him which embody certain principles.

When the method of discovery is thus blended with the observation of principles for oneself, an appeal is made not only to the abstract intelligence, but to the independent initiative of the child. His consciousness of power is excited, and he enters into a sympathetic attitude towards the course of the world. This aim, lofty as it may seem, has been realized by teachers like Froebel. For in the more perfect forms of the inductive method, the teacher is the hierophant introducing the learner to the shrine, but he leaves the learner himself to draw aside the veil.

Along these lines the activities of school become more closely parallel to the activities of life in the

great world, and the transition from school life to life's vocation is rendered more easy. And the attitude of the teacher to his class is changed. Instead of stating principles in an authoritative way, and dealing simultaneously with many pupils, the teacher finds a separate problem in each individual scholar. But we must not exaggerate the demand which is thus made upon the teacher's time and attention. The clever child can often be dealt with at a glance, thus leaving more time for backward pupils. The group of pupils thus working together will rather resemble a laboratory than a classroom. The teacher will be like a foreman going round a workshop advising, correcting, or encouraging craftsmen, each occupied with his own task. And the silence and order which are the traditional accompaniments of teaching by general precepts will give way to some extent to the movement of a laboratory.

But there are two limitations to the application of the inductive method. In the first place, some subjects are best treated in an authoritative manner. This is probably the case with religion, morals, history, literature, and art; that is to say, humanist subjects. But, even here, we must bring the child face to face with the corresponding facts.

In the second place, the inductive method involves a greater mental strain than the method of passively receiving principles from another. And it is necessary to watch for symptoms of overstrain.

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SECTION XIII

FALLACY

FALLACY occurs whenever an invalid inference masquerades as a valid one, and to no other form of mistake is the term rightly applied.

As inference means the use of evidence to establish conclusions, there are two main sources of fallacy. In the one, evidence is wrongly apprehended; in the other, an illegitimate use is made of evidence rightly apprehended. Fallacies of the former class show defects in the actual knowledge brought to bear on the case in question; those of the latter, lack of skill in using it. Of course, the two kinds of fallacy often occur together, but it is well to distinguish them, as remedial treatment of the one has no necessary influence on the other. Mediæval thinkers were far more carefully trained to use premises legitimately than to secure that they were both true and adequate; as a consequence, their knowledge of facts remained defective. In modern times, both the opposite tendency and the opposite result are conspicuous.

A clear recognition of this is very desirable in education. Children are naturally liable to fall into both kinds of fallacy, for neither knowledge nor skill in using knowledge is innate. The need for increasing the former is much more fully recognized in school practice than is that for developing the latter. Yet skill in thinking is no more a gift of nature than is any other form of skill, and without it knowledge is mere erudition—of little or no value.

Its development depends on the method used in teaching, just as growth of knowledge is determined by the matter taught. Its acquirement comes through criticized practice, as does that of every other form of skill. Mental activity is innate, and it must assume its own competence or it could not exist. Throughout life it works largely without receiving explicit attention; it is known by its results.

When these disappoint expectations, there is need to bring into the light of day, for critical examination, the processes which led to them. The detection of any flaw is the discovery of fallacy. From the point of view of training in skill in thinking, therefore, errors are of the first importance. They bring home to the pupil the need for revision, and give the teacher the opportunity of making clear the kind of mistake made. The school custom of simply correcting error does nothing to train skill in thinking, and shows a mistaken estimate of the absolute value of pieces of information.

Though fallacies are legion, they are of comparatively few general kinds; and teachers would do well to study them in any good text-book of modern logic, and to exercise themselves in detecting them.

Many fallacies are induced by ambiguities of language. The scope of a term is not clearly apprehended, and so there is included under it what should not be so included; or what properly belongs there is excluded. This is one source of that illegitimate generalization of statements which is one of the commonest ways in which the untrained mind goes wrong. Here, again, the attaching undue importance to information may lead a teacher astray. A pupil may give as the conclusion from very inadequate evidence a general statement which is true in fact, and which the teacher wishes to receive. That is accepted for its own character, regardless that such acceptance not only does nothing to train in clear thinking, but actually helps to build up the contrary habit. In illegitimate generalization, a suggestion is taken for a well-grounded statement. Any observed connection suggests an inquiry into its extent, and the assumption without such inquiry of the validity of any particular extension beyond the evidence itself is one form of begging the question, or assuming the very thing that has to be proved. There are many other cases in which the fallacy is of essentially the same kind—the taking a probability, without any determination of its strength, for a certainty. Sometimes the invalidity

is apparent on examination of the form; at others, knowledge of the matter is needed to see just what the premises are competent to establish. But in every case in which a pupil gives a statement as an inference, the teacher's main function is to test the validity of the process, whether the conclusion be true or false in fact. For the importance of habit should be remembered. A habit of accurate thinking is formed only by much undeviating practice, and it is the most valuable intellectual possession education can give.

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SECTION XIV

CORRELATION

THE term "correlation" has two quite distinct meanings in pedagogical psychology. It is, in the first place, a statistical term. The correlation formula of Bravais and Karl Pearson—

$$r = \frac{S(d_1 \times d_2)}{n \times \sigma_1 \times \sigma_2}$$

simplified by Spearman to—

$$\rho = 1 - \frac{6S(d^2)}{n(n^2 - 1)}$$

is a means by which the relationship or "correlation" between two qualities possessed by a number of individuals, for example, between the stature and the mental ability of human beings, may be calculated. Maximim positive correlation works out to + 1; maximum negative (or inverse) correlation to - 1; absence of all correlation to 0. In the case of most qualities that concern the educator, correlation is positive, but not usually very high. Thus, the correlation between arithmetical accuracy and arithmetical speed might, in a given class of boys, be represented by less than .5, this number indicating that the more accurate boys tended on the average to work more quickly than the slow boys, but that there were numerous exceptions. If the number were very high (e.g. .96), it would indicate an almost perfect parallelism between the two qualities; if very low (e.g. .06), that very little relationship existed between them. The statistical theory of correlation is expounded "popularly" in the writer's *Educational Administration and Criticism* (Chap. XV).

Correlation of Subjects. The other sense of the word "correlation" is connected with a cardinal

principle of the Herbartian and Fröebelian movements. The separation of one school subject from another (e.g. Arithmetic from Geography, Geography from History, History from Handicraft, etc.) was perceived by those two great educationists and their followers to be accompanied by many disadvantages. For example, an important source of interest was left unused; it is always interesting to find ideas in one department of human activity throwing light upon ideas in another. Again, the division of school work into "subjects," each forcibly separated from the rest by time-table prescriptions, tended to divorce school work from life. Thus history meant book-history, not current events, or Bible history, or history of the tools used in the handicraft lesson; composition meant writing essays, not conversing naturally and correctly on a theme. Thirdly, a divorce (which still runs through school work) was established between instruction and training, ideas and habits, theory and practice; so some "subjects" become too theoretical and others not theoretical enough.

No educationist is a safe guide who does not realize how deep-rooted is this tendency of the human mind to work in compartments. One of the chief problems of education is thus, while training the mind to certain "efficiencies" each distinct from the other, to preserve the mind from slavery to this "compartment"-working tendency. The pupil has to become a specialist without ceasing to be human. He has to preserve a naïve, child-like outlook, so that he will not neglect charming and correct speech in ordinary life while heading his class in grammar. The task for education, as thus conceived, is to fight against a deeply-rooted human instinct; but the task should not be made the heavier by attaching sacrosanctity to "subjects" and "time tables."

In reaction from this idolatry of "subjects," there are contemporary educationists who, if the implications of their doctrines are to be accepted, would reduce school work to sheer chaos. (See LAISSER FAIRE IN EDUCATION.) The real solution

appears to lie along the lines of a series of school occupation-units, each involving theory and practice, ideas and habits; and, taken collectively, introducing the pupil to all the larger phases of human life. The early Fröebelian and Herbartian workers were moving towards this standpoint in their proposals for "correlation" and "concentration"; and some of their attempts, while suggestive, overshot the mark.

Possibilities of the Principle. The correlation principle itself is sound, and stands for nothing more than the linking together of such facts and processes as have a bearing on each other. Thus, if certain geographical facts explain certain historical facts, the history teacher should temporarily become a geography teacher, and so on. The correlation principle is a mere return to common sense and a protest against pedantic and unnatural distinctions and separations. It has, however, its own limitations. Owing to the fact that everything in the world is connected with everything else, directly or indirectly, a teacher who is devoted to "correlation" may easily become dangerously discursive. Much ridicule has been poured upon the principle because of the artificial or unimportant links which some teachers have discovered and employed. Like every other principle, that of correlation has to be applied with common sense, otherwise—itsself a protest against pedantry—it becomes the pretext of a new kind of pedantry as pernicious as the old.

SECTION XV

SPECIALIZATION

A SPECIALIZED course of education or training is one in which the intensive study of a certain subject or group of subjects occupies a large proportion of the time devoted to the course. Specialized courses in our schools at the present day aim at providing either a definite type of liberal education, or a specific preparation for some calling or class of callings.

Of these two forms of specialization, the former is connected with a theory of education which originated in the eighteenth century. In the Middle Ages, a liberal education included the elements of all the chief branches of knowledge. It proved impossible, however, for education thus conceived to keep pace with the rapidly-growing complexity of the knowledge it was supposed to cover, and at the same time stress came to be laid upon the intellectual discipline derived from the study of certain subjects apart from the value of the information gained. The view won acceptance that a very limited curriculum would supply a complete mental training and a general preparation for later life, provided that the right subjects were chosen for intensive study. Thus the secondary schools were led to adopt a specialized classical curriculum. The same principle has been applied in a more or less modified form to the teaching of other subjects, and the senior boys and girls in schools which keep pupils until they are 18 or 19 years of age are generally given the opportunity of specializing in *e.g.* mathematics, natural science, history, or modern languages. (The method by which Entrance Scholarships are awarded at Oxford and Cambridge has been influential in perpetuating the system.) The educational theory upon which this form of specialization was originally based is, however, rarely accepted in its entirety, and the specialized curricula usually include certain subsidiary subjects.

Specialization for a Vocation. The second, vocational, form of specialization has been developed rather in response to social and economic influences than to any change in educational theory. The demand for technical skill and knowledge is growing more insistent in many occupations, and an appropriate specialized training has proved a valuable help towards providing efficient members for these callings. The realization of this fact has led to the organization of various types of technical schools, including junior technical schools and continuation schools and classes, as well as specialized vocational courses in secondary and primary schools and at the universities.

Experience has shown that, under suitable conditions, excellent results may be produced by both types of specialized instruction, and it can hardly be doubted that an extension of the facilities for vocational specialization would be of great advantage to the nation. On the other hand, the effectiveness of the specialized training given in the schools has sometimes suffered from the lack of a clear conception of the educational principles involved and of the methods of instruction which should be adopted. The training provided has often been one-sided, and has, therefore, failed to fulfil even the limited purpose for which it was designed. The evidence of several witnesses before the Royal Commission on the Civil Service shows that, in the opinion of competent judges, the value of a sound general education for the future holders of important positions in industrial, commercial, and professional life is greater than that of a narrowly specialized training.

Further investigation and experience are needed before the limits within which specialization is desirable can be determined with precision, but in any case it is clear that a specialized course should always form a part of a wider training which does justice to interests other than those with which the specialized course is immediately concerned. Education should bring the learner into touch with all the great fields of human interest. This aim, however,

can be accomplished in two ways. By means of a general curriculum, the learner's interests may be developed on more or less independent lines. Or some one interest may be given special prominence and other interests treated as subordinate elements in the system of this central interest. The latter method gives coherence to the training, and the strength of the central interest tends to impart a sense of reality and purpose to the whole of the boy's schoolwork. Thus, if the learner's interest is concentrated on his future calling, it is comparatively easy to bridge the gulf which too often divides the school from the world outside. For this reason, a specialized training for an occupation which the pupil will not enter may, under certain circumstances, prove a sound course of education. On the other hand, it is not possible as a rule to make the central interest comprehensive enough to serve as the focus of the whole curriculum. A general and a specialized course of training emphasize two different aspects of mental life. The former endeavours to do justice to its complexity, the latter to its underlying unity.

Specialization in a Liberal Education. A satisfactory synthesis of the two complementary points of view depends in detail upon the particular circumstances of individual cases; but, in principle, a specialized education may be made liberal in the truest sense, provided the right methods of instruction are adopted. It is here that specialized training has too often failed. Attention must be concentrated not upon details of purely technical importance, but upon the wider aspects of the subject, possessing a general human interest. Thus classics should be taught as "the great science of civilized man" (T. Arnold), not as a collection of linguistic niceties. Similarly, specialized vocational instruction should aim primarily at awakening an intelligent interest in the characteristic processes of the particular calling and an appreciation of the part played by the calling in the life of the community. The work done in the classroom or the laboratory should be in living contact with the interests and

problems of the corresponding field of human effort in the world outside. The study should not be merely academic. Thus a vocational course of training should have constant reference to the conditions actually obtaining in the calling.

If these principles are observed, there seems to be no reason why the advantages of specialized instruction should not be secured without sacrificing the paramount claims of a liberal education.

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SECTION XVI

“ LAISSER FAIRE ” IN EDUCATION

THOSE who conceive of education as a vast constructive process, accept *laissez faire* (“leave alone”) only on the assumption of drastic changes in national organization, and must continue to maintain that, without those changes, the policy would be mischievous and absurd.

Laissez faire means good-bye to many things—to clergy in the school, to syllabuses of Biblical instruction, to time-tables and punishments, to schemes of work, and to school routine. Also—for, if *laissez faire* is to apply to the child, it must apply *a fortiori* to the adult (a fact rarely recognized)—good-bye to ranks and hierarchies in the teaching and other professions, to the raids of inspectors, to supervision by head-teachers, to secret reports, and all other devices by which liberty is at present held in check.

That we have to slough off many of our cherished methods of education and administration it is hardly possible to doubt after a study of the recent Holmes-Montessori-Shaw literature and of the Rousseau-Tolstoy literature that preceded it. But the question is: “Whither will this idea of liberty lead us?” Whither, for example, the following proposals, taken from Holmes’s *What Is and What Might Be*?—

The school must not give “definite dogmatic instruction in theology.” Nor in “patriotism,” “citizenship,” “altruism,” or “morals.” The teaching of such matters, if given at all, is to be “entirely informal and indirect.” There must not be dogmatic instruction in “number.” Nor in “literature,” “history,” or “chemistry.” Nor, outside the usual school subjects, in “business,” “navigation,” or “driving vehicles.” Nor in “any art, craft, sport, game, and pursuit.” All these things are to come as matters of “growth.”

Mr. Shaw, in *Parents and Children*, catalogued certain tasks which the school should systematically not avoid but attempt. The child, he tells us, must learn to walk, to use a knife and fork, to swim, to ride a bicycle, to acquire some power of self-defence, —not to waste other people's time; that is, it must know the rules of the road, be able to read placards and proclamations, fill voting papers, compose and send letters and telegrams, make purchases, count money and give and take change, and go simple errands and journeys. It must acquire some technical training and know "some law, were it only a simple set of commandments; some political economy; agriculture enough to shut the gates of fields with cattle in them, and not to trample on growing crops; sanitation enough not to defile its haunts; and religion enough to have some idea of why it is allowed its rights and why it must respect the rights of others." Again, he suggests that there is a criminal taboo not only on economics, but on sex knowledge, and that this taboo should be removed.

All this hardly conveys the impression that Mr. Shaw is an advocate of *laissez faire* in education; the extent of his kinship with Mr. Holmes cannot easily be indicated.

Madame Montessori has not yet discussed the senior child and the adult; provisionally we may regard her as a gifted practical teacher, with strong convictions on the value of direct sense-training and of individual liberty.

Arguments in Favour. *Laissez faire* is advocated for two chief reasons—

1. *The vileness of seeking to capture the child's mind before he has power to think for himself.*

2. *The impossibility that, in matters of appreciation (literary, musical, artistic), teachers, who are average people rarely inspired by any inward call to teach these subjects, can create any taste for them.*

There is sufficient truth in these charges to justify an impeachment of our elaborate educational system. Admitted that the teacher performs a humbly useful function in purveying (see Mr. Shaw's list

above) a few necessary habits and ideas which are neither controversial nor too subtle to be beyond the capacity of "bores"—a good *prima facie* case can be made out for leaving all controversial matters of morals and theology, and all subtle matters of literature and art, to voluntary workers who obey an inner call to teach or create. The function of the State would then be to see that a rich repast of great controversy, great books, great drama, great music, and the like is freely accessible to all comers. Everything would be voluntary in such a system, though everything would also be copious, well organized and cheap; the youth would be allowed to read and see and hear what he liked; the preacher, artist, and author would say and do what they liked; no longer would the professions be money-bound and no longer would the child, youth, or adult be their victim.

It is conceivable that *laissez faire* amid such possibly Utopian conditions would be an effective as well as a noble educational policy. Certainly the ideal of liberty would at last be nearly realized.

Suggestions. The present system is far from satisfactory. Efficient the teacher is in twenty ways, but he has not necessarily the soul of the artist, the poet, or the prophet. If here and there he awakens a living interest in non-utilitarian things, he is the exception that proves the rule of freedom; he is the inspired one who alone should be allowed to do prophetic or artistic work.

Can improvement come through administration, in view of the fact that administrators are as frequently unimaginative "bores" in their own domain as teachers are in theirs? It is possible that educational machinery might become living machinery; the teacher who "bored" his pupils would then be discovered and employed in less subtle tasks; while brilliance of class-teaching would be rewarded, not, absurdly, by head teacherships, but in sensible ways. Without some such revolution, there is little hope of extensive improvement; the voice of mediocrity, ever defending itself, is the only influential voice heard at teachers' unions

and educational boards, and it is not through this voice that the problems here raised will be solved.

The problems, indeed, are serious ones. On moral matters, it is plain that the educationist cannot "stand aside" from the child, seeing that the forces of temptation do not stand aside.

Meanwhile, the proposal that everything is to be taught informally, indirectly, and incidentally must be regarded as an educational joke. The thing is impossible. There must be some central subjects, or, at least, some central training processes. The abolition of time-table "subjects" is conceivable and, perhaps, desirable; but the proposal as it stands is in flagrant conflict with the investigations of the Columbia University psychologists, with their stress on specific training and clear purpose.

The value of the *laissez faire* propaganda must thus remain at present chiefly negative. It is a protest against the lust for authority that lurks in reputable as well as disreputable hearts.

SECTION XVII

EMPIRICISM

THERE are probably few topics of general interest that exhibit more difference in opinion than the nature and methods of education. During the last half-century much thought and discussion have been expended on the subject. There is as yet no universally accepted theory as to its methods or its aims. Three recent public utterances by men of some authority will illustrate this statement—

1. "We may get some approximation to a real system—a system that does not regard the teaching of a multiplicity of subjects, or the amassing of innumerable facts, or the passing of examinations as the end or ideal of education, but the enthusiasm for learning, the desire to know, not in seeming but in reality the ambition to become, if not the spectator of all time and all existence, at any rate a wise and trustful and earnest seeker after the eternal verities of life."

2. "After this war we should have to face a demand from the public for a complete re-organization in matters of education. We should hear a great deal of the demand for scientific training with a view to technical application, and we should have to teach scientific facts to a degree we had not hitherto taught them. But when we had done all that, we should still be left with the duty of giving them what is called 'outlook.' Our young people must know where they were in time and space. Public-school education in this country has had the effect of giving judgment to the Englishman, even if he might be relatively ignorant."

3. "Some knowledge of chemistry, physics and geology in place of the Greek and Latin languages,

literature and philosophy, would quicken the wits and enhance the administrative utility of our public servants."

Opinions so diverse are difficult to reconcile so as to show unity in idea and unanimity in method. The problem is viewed from different standpoints. But method will depend upon the views as to the real aim of education. This may be to qualify the individual for the practical business of life: to this end some would emphasize the development of the mental powers generally, some the foundation of character; others, again, knowledge and capacity for a special sphere of practical utility and work. A combination of all these views may come near to the ideal aim of qualifying youth to play their part; as good citizens, as useful members of society, and contributors to the common welfare.

To this end it is urged by some that education should be *vocational*; that is, specially adapted to the proposed life-work of the individual. This is the utilitarian point of view and may be very properly considered in schools specialized to prepare for a particular career.

One point, however, that emerges from this controversy is that the method of education will depend upon the prevailing ideas on education, and that, with so many conflicting ideas, there will be diversity of method, at all events at the later stages of school life, each dictated by its influence in qualifying for some specific field of work. Methods are many and tentative; they will vary in detail not only with the end in view, but with the experience and judgment of the teacher: hence such methods are *empirical*.

Empiricism in Science. This term is not explicit: it came into use with the development of modern science, and its exposition by the methods of inductive logic which was the philosophical instrument for explaining the uniformities of Nature. All important stages in the growth of knowledge have been empirical in their origin and early investigations. The wonderful discoveries of scientific research originated from the indefatigable

zeal for experiment of men of genius like Darwin, Huxley, Tyndale and Roscoe.

The tendency of the utilitarian school of philosophy was to emphasize the material benefits which followed from their methods of investigation. Emphasis upon the practical application of science to advance material well being, and the advocacy of technical education as a means to increase industrial power and add to economic welfare, indicate the tendency of modern thought on education in its practical aims. The strong advocacy of public expenditure upon education is generally based on its material advantages to the nation. The old educational endowments of grammar schools and universities aimed at intellectual development and the literary culture which were associated with classical and philosophical studies: it took little note of the economic and material aspects. The present age of scientific progress seeks for material results, the increase of wealth and social and national development.

The two aims of mental and material development are not wholly incompatible or antagonistic, though the tendency is for the material to over-shadow the purely mental and philosophical. One distinct tendency emerges: this is, scientific method has punctuated and dominated education; and scientific method is experimental. Enthusiastic teachers will generalize their own experience, but this experience is singular and specialized, hence their conclusions are *empirical*: i.e. based upon limited conditions, and they cannot possess the exactness and uniformity of scientific proof. They rest upon individual and limited experience. Applied to such generalizations, the term empirical does not connote distrust, but merely that the generalizations of so limited a character do not satisfy the requirements of rigid scientific method, and cannot be regarded as scientific laws.

Empiricism in Education. The term *empirical* thus comes to be applied in education to generalizations from experiments on a limited scale, for which the law of uniformity cannot be claimed with

certainly, as in the rigid sciences such as physics, where tests and exact methods yield a uniform result, and verification can always be obtained. The empirical law falls short of these exact tests: it is a generalization based on a limited and unverified field of observation, not open to universal proof. Most enthusiasts are prone to the logical defect of generalizing their limited experience; hence the term *empirical* is properly applied to their methods and results. Teachers differ greatly in experience and in sentiment: the local conditions also vary. Education is not like a technical industry or a scientific experiment, organized and carried out in known conditions with uniformity and exactness. Nor is an enthusiastic teacher indifferent, like a physical force. The term empirical came to be applied in education to new experiments and methods by a kind of similarity to the experiments of physical science. Physical science gives laws of Nature by its verified experiments, and uniformity; such laws can never follow on the limited experience of school experiments. But the development of science teaching in schools gave prominence to experimental methods and their application to life and industry. Education thus became more scientific in method and direction, at the cost perhaps of some loss to classical study and its long established priority in the school curriculum.

In recent years many new advances in science have tended to strengthen the utilitarian basis in education, and the training of youth with a view to commercial and industrial pursuits has given a bias to the more material direction of education. This is inevitable with the vast development of scientific knowledge and its technical equipment for industry and business.

Education now enjoys considerable State aid, direction and control. It is enforced by public authority and administered under public direction and largely at public expense. A practical utilitarianism dictates the outlay and the regulations, and influences the methods. Aided institutions of every grade under government inspection tend

to similarity and some degree of uniformity in their respective grades. By inspections, conferences, magazines and papers they tend to produce something like a science of education, embodying approved views and methods. The interchange of experience, criticism and diffusion of novel ideas and experiments, yield something like common theory. It would be remarkable if, in time, this organization did not yield scientific methods in education. Meanwhile, controversy, criticism, experiments, go on amongst a body, many of whom are enthusiasts in their vocation. New ideas will be promulgated, new methods suggested based upon individual experience and thought. Here we have Empiricism illustrated: Until such methods have been tested by time and experience, and are endorsed by some common adhesion, they cannot be other than empirical. When they have stood the test of criticism and wider application, and are found to be scientific in character, they will become accepted as principles of method; they will then cease to be empirical, and be adopted by succeeding teachers as recognized, proved theories and will become the acknowledged principles of guidance in the science of education.

SECTION XVIII

THE CONVERSATIONAL METHOD

By "the conversational method" in education is meant the method of teaching the younger children by conversation, chiefly in the form of question and answer, rather than through books. It is not confined to the younger children; much of the work in history, in geography, in literature, and especially in science and languages, is carried out by this method, to a greater or less extent, according to the school. Its uses in the junior school are various: in the Nature lesson (and where the practice still holds, in the Object lesson) it is most largely used; the children's observation is directed by means of questions towards various aspects of the thing in hand, and the answers show the quality of the observations. In some cases, this is carried to the extent of demanding that each answer shall be framed as a complete sentence. In Arithmetic, ideas are arrived at by encouraging the children to manipulate various kinds of concrete materials or prepared apparatus; and afterwards, by means of this method, leading them to form general rules. Training in the mother tongue is carried on in this way also; by means of pictures, games, plays, puzzles, etc., children are encouraged to express themselves freely; poetry and stories are fully commented on by the class.

Purpose and Scope of the Method. Teachers who practise this method seem to have two aims: (1) To lead the children to discover facts by their own efforts, instead of being informed by the teacher or through a book; (2) to give the children an opportunity to express themselves. In the case of the older children, the first aim is further augmented by a desire to encourage them to analyse facts and, by reconstructing them into general ideas, to form opinions and theories. The method is a very distinct reaction from the method which preceded it.

Formerly, a passage in a book was prescribed and, after the children had gone through the process of what was called "learning their lesson," they were "heard": this consisted in the teacher questioning the children on the passage, and the usefulness of the process varied with the intelligence of the teacher. Non-intelligence was provided for in the middle of the nineteenth century by the preparation of books with both question and answer. When the framing of the question devolved on the teacher, the less intelligent framed them merely on the recapitulation of the verbal matter; the more intelligent caused the child to consider, analyse, and reconstruct. Roughly speaking, the oral method might be described as inductive, while the book method is more deductive; but this distinction does not bear too severe an application. Such are the two extreme methods. While the oral is at present the most widely spread, there is undoubtedly a slight reaction, not exactly in favour of the older method, but of adjusting the balance more truly. There prevailed, and to some extent still prevails, in the minds of many teachers, a very strong tradition that children must on no account be "told" facts, but must be "led to discover them." The theory was often applied without discrimination and intelligence: from it has sprung the much abused term "elicit," and some very absurd situations have arisen in its name. Children have been questioned on matters quite strange to them; they have been led to guess the subject of the lesson, even names of people, on merely verbal clues. An actual example might be cited of a teacher who preceded a lesson on "The Swallow" by drinking a glass of water in front of the class, and then requiring them to name the subject of the lesson by referring to the operation she had just gone through. This method may, however, lead to valuable work by giving sufficient guidance in the form of leading questions to guide the children to independent discoveries. It has more than one source; indirectly, Comenius and Rousseau may have put us on its track in their reaction against

the tyranny of the Renaissance. Pestalozzi gave a direct lead, with his object lesson and by his use of the concrete method; Froebel's theory of self-expression gave it another and different value; and, in our own time, Professor Armstrong's advocacy of the Heuristic Method has permeated much of the work of the school. Probably we are now beginning to find that the true place of oral teaching is to encourage and guide discovery, and to develop self-expression. There is undoubtedly a time to tell, a time to read, and a time to discover. But education is many-sided, and its ways are manifold.

SECTION XIX

THE PREPARATION OF LESSONS

AN article on the subject of the preparation of lessons must necessarily be general in its character, and definite information must be sought for under specific subjects. There are, however, certain main principles which may guide the teacher in preparing a lesson. His chief consideration must be the effect upon the child, for the selection and treatment of material can only be determined with due regard to the age and previous knowledge of the class. The importance of accurate knowledge on the part of the teacher cannot be too strongly emphasized, and the use of school text-books as the only source of information is to be deprecated. A bibliography formed by the teacher as a result of his practical experience is of great value.

The importance of a careful consideration of teaching method depends on the well-established belief that, intellectually and morally, the mind of the child is influenced by the manner of acquiring knowledge no less than by the knowledge itself. Although the form of any lesson must be decided by its own particular bearing, certain considerations are of permanent value.

A set form is always liable to become stereotyped and mechanical in application, but outline notes have their use and should follow a definite scheme, while each lesson or sequence of lessons should be planned with a clear purpose. The teacher must, within possible limits, ascertain what the class already knows and so build on that foundation, for a most important aim in all instruction, both moral and intellectual, is to unify knowledge and to lead the pupils to see order and connection in apparently disjointed facts. The realization of great general laws and ideas must be the ultimate goal of every learner. Hence the teacher sets before himself a

definite end in every lesson or series of lessons, which he will test when he reaches the conclusion, and in his preparation he must exercise his imagination to the extent of realizing not only his subject-matter, but the capacities and the difficulties of his class.

The main divisions of a lesson may be regarded as three: the introduction; the presentation of the new matter; and the conclusion.

The purpose of the introductory stage is to prepare the children's minds by giving them some indication of the scope of the lesson, by gathering up the threads of their previous knowledge, and by emphasizing certain points and aspects necessary to the particular lesson.

The methods of the stage of presentation are various, and are determined by the subject and the class. Some lessons consist entirely of oral exposition by the teacher, and in these the main problem is the selection and arrangement of the matter in due sequence. Their success depends on clear presentation and on a good command of language. Story and descriptive lessons in literature, history, or geography illustrate this type.

Where the general idea is of a more precise and definite type, as in mathematical, scientific, or certain language lessons, the more exact methods of induction and deduction can be employed. The ultimate aim of both these methods is the same, for the goal of each is the general idea, and the essential difference between them is one of procedure. In school work, both are largely employed, neither of them exclusively, for they involve one another.

The methods may be briefly explained. In induction, the method largely used in presenting new matter to a class, the stages are the collection and treatment of material involving both observation and experiment; the formulation of the general idea, expressed, as far as is practicable, by the class itself; and the application of the general idea to the particular case as a test of its validity, a process which in itself is deductive.

The general idea may be of various types, such as a definition, a classification, a general law. Illustrations of these types may be found in science lessons, in the modern scientific treatment of grammar, in the method by which the child is led to discover the new process in arithmetic or any branch of mathematics.

In deduction, the method of procedure is to pass from the general idea to its application to the particular case; as, for instance, in the solution of an arithmetical problem through some process already made familiar to the class by induction, or an exercise in composition involving some special grammatical rule, or the application of a natural law to the explanation of some common phenomenon.

In both the inductive and the deductive processes, the final stage of the lesson will test the validity of the general idea; and in any lesson or series of lessons the stage of revision should involve, in addition to mere recapitulation, the application of the new knowledge or aptitude. Hence no less careful thought must be given to this stage than to that of the presentation of the new matter.

Apart from the consideration of the general structure of a lesson, the intelligent anticipation of detail is all-important; the use of the blackboard, whether for incidental work or as an integral part of the lesson; the choice of illustrations; the form of questions—are all matters for careful consideration in preparation, which very largely contribute to its success.

SECTION XX

STUDY

THE term "study" is used, especially by American writers on education, to denote the process by which the boy masters some subject or solves some intellectual problem. ("Boy" is here used in the sense of "boy or girl," and "master" in the sense of "master or mistress.") The term is sometimes employed to cover both independent and co-operative work (e.g. the preparation of a lesson by a boy at home and the discussion of the lesson in the class). It seems, however, more convenient to follow the alternative practice of confining the meaning of the word to the former type of process. Study is then, roughly, equivalent to independent work, including the preparation of lessons and other forms of systematic intellectual work carried on by the boy in relative isolation.

Recent developments have tended sometimes to obscure the importance of the individual aspect of intellectual progress. Justice has been done to the social basis of knowledge, and stress is laid upon the stimulating influence of the social environment in which learning is carried on. The boy learns or produces mainly as a member of a class, making his contribution to the result which is achieved by the co-operative efforts of himself and his fellow-members. This emphasis on the social aspect of school work has undoubtedly led to results of great and permanent value; but, just as the close association with our fellows, which is the condition of intellectual and moral evolution, needs in the interests of mental health and strength to be relieved by opportunities for privacy, so the work done by the boy in class must be supplemented by work done by him as a separate individual. (See Graham Wallas: *Human Nature in Politics*, p. 50 ff.) If he has been accustomed to put forth effective intellectual effort only when stimulated by the

guidance or co-operation of others, he is likely when left alone to lack initiative and resource. The effects of too exclusive a reliance upon class work are seen in many schools. Even if the independent task is successfully accomplished, it is accomplished only by the expenditure of unnecessary time and energy.

It follows that a boy should be given systematic practice in working independently, and that he should be specifically trained in the use of economical methods of study. The necessary guidance is given by many masters in special cases, but the general problem of how to study rarely receives the attention it deserves. In any discussion of this problem, full allowance must be made both for the boy's individual characteristics and for the special nature of the task to be performed. Still, certain general principles may with advantage be impressed upon the boy. Of these principles, two only can be mentioned here. In the first place, the conditions under which the work is done and the arrangement of the work itself should reduce fatigue to a minimum and obviate waste of time. Most masters must have been struck by the failure of many boys to put their apparatus (*e.g.* their dictionaries) in the most convenient place, or to prepare a series of lessons in the most economical order. Occasional brief expositions of the theory of fatigue might lead to a more appropriate procedure. It is possible also to encourage labour-saving devices in such matters as note-taking, the use of abbreviations, and the introduction of occasional pauses into long periods of work.

A second principle is that the task to be achieved ought, speaking generally, to be attacked as a whole or, at any rate, as a system of connected wholes. This principle is an application of the coherence theory of knowledge, the approximate truth of which is here assumed. (See References below.) Thus if a boy has to learn a poem by heart, he should be told to learn the poem, or a section of it, as a whole. Similarly, if he desires to master some portion of a book (*e.g.* a chapter of a text-book,

or a proposition in geometry, or a passage in a foreign language), he should try, in the first instance, to obtain a bird's-eye view of the matter with which he has to deal. The same principle holds good also when the boy is engaged on more original work (e.g. when he is writing an essay, formulating a theory, conducting an investigation, or constructing some material object).

In order that the boy may acquire the habit of applying these and other relevant principles, the work he attempts must fulfil certain conditions. It must, for instance, appeal to him as being of intrinsic value. In some instances, the specific aim will be chosen by the boy himself, in others it will be prescribed, but in any case the whole process of study should be inspired and guided by the boy's endeavour to satisfy some interest of his own. If the aim is determined for him, it is generally important that it should be clearly defined. Vagueness of aim tends to diminish the satisfaction in achievement, which is one of the main incentives to study. The task must evoke the boy's initiative and yet not be so difficult as to render his best efforts fruitless. If a boy is led systematically to study on these lines, experience shows that a marked increase in his powers of original work may be expected.

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SECTION XXI

QUESTIONING

QUESTIONING is essentially a ready means of acquiring information. In a child, it is one of the clearest signs of mental alertness. The questioning age, which commonly begins about the fourth year, is a critical period for mental development. Careless treatment of the questions of a child may lead to the formation of bad mental habits. It is advisable, as far as possible, to answer his questions, but with discretion. Intelligent and patient investigation must not be discouraged by lightly answering every question. A child should be encouraged as far as possible to answer as well as to ask his own questions; otherwise he develops the habit of looking to others for answers to his inquiries, and loses initiative. Idle, pointless questioning is encouraged by answering any and every question. On the other hand, refusal to reply deprives the child of the guidance necessary to avoid waste of time and energy.

As a teaching device, questioning tests knowledge and stimulates thinking. In using it to discover a child's stock of ideas, considerable skill is required. Questions should not be so vague that they encourage indiscriminate guessing, nor so narrow as not to provide scope for individuality. Nothing is less inspiring than a string of short questions, the answers to which call for nothing more than parrot-like efforts of memory.

As a means of stimulating imagination, observation and thought, questioning is invaluable. A carefully constructed series of questions calls forth considerable effort in recollection, comparison, and judgment. It does more. It demands careful expression of ideas, for the obscurity of one's ideas is generally reflected in the language in which they are expressed. This has led some teachers to demand that all questions should be answered in complete

sentences—a practice which is open to abuse. It is somewhat pedantic to insist that, in answering the question “What is the capital of France?” a child should not be allowed to reply “Paris,” but must be taught to say: “Paris is the capital of France.”

Some subjects (*e.g.* mathematics and the natural sciences) lend themselves more readily than others to development by questioning, but too much stress need not be laid on this; for, wherever thinking is to be done, thought can be stimulated by carefully selected questions. The skilful use of questions is the supreme test of a teacher's efficiency. It demands a thorough knowledge not only of the subject under discussion, but also of the student, and a nice judgment in selecting topics and forms of expression. The teacher must know the extent of his pupils' knowledge; the images, thoughts, and feelings that will probably be excited by his questions; and the mental efforts of which they are capable. S. D.

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